COMPUTERWORLD

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Limiting Access to Centers Called a Major Problem

By Peter F. Carr
CW Staff Writer

EAST ORANGE, N.J. – Computers should not be part of an image-making display for their owners, according to the president of a computer company here supplying security consulting services to the data processing industry.

"There is a definite degree of vulnerability involved in placing a computer at ground level," said Joseph Wasserman, president of Computer Audit Systems, Inc.

"Ten or 15 years ago, owners tended to put their computers on the ground floor, but computers are no longer unique to the business or academic community. In the present environment, when so many groups are anti-computer, it is deliberate carelessness to make a showpiece out of a computer center," he said.

The 'Badge-Key' is a typical access control device which will sound an alarm to the guard station if the employee is not authorized to enter.

Wasserman sees the era of the showcase computer passing away. "At present, new 'showcase centers' are limited mainly to the major computer vendors. "The main factor to consider in a normal installation is the sensitivity of the information."

Louis Scoma, president of Data Processing Security, Inc., of Hinsdale, Ill., a security consulting company and supplier of security systems, agrees.

'Invite Trouble'

"Many companies invite trouble because they regard their computer centers as showcases for their corporate facilities. They are proud when showing visitors the

(Continued on Page 8)

Bernhart-Fetter Precedent

First Program Patent Issued Under New Rule

By Edward J. Bride
CW Staff Writer

WASHINGTON, D.C. – The line forms here.

The first of perhaps 500 computer programs has been approved for patenting, under the new *Bernhart-Fetter* policy of the U.S. Patent Office.

That policy, reached last November by the Court of Customs and Patent Appeals (CCPA), said that computer programs could no longer be automatically rejected by the Patent Office. Shortly thereafter, a "notice of allowance" was given to applicants Walter D. Bernhart and William A. Fetter.

Now, the developers of Autoflow, one of the most widely used proprietary programs, have been informed that they have apparently become the first to reap the spoils of that battle.

The Patent Office has sent a "notice of allowance" to Applied Data Research Inc. (ADR), of Princeton, N.J., stating that its application for a patent for Autoflow will be approved.

It is apparently the first time that the Patent Office has made such an approval without fighting the application in the CCPA. Now, all that remains before actual issuance is that the Patent Office have the patent printed at the Government Printing Office.

The patent, filed in 1965, was granted to ADR Vice-President Martin Goetz and is assigned to the company.

ADR President John R. Bennett said that the patent represents a "victory for advocates of patent protection for software products," and supports ADR's long-time public position that patent protection could be established for inventions in the software field.

Plot Patent Permitted

In April, Computer Graphics Inc., of Wichita, Kan., received its "notice of allowance" for the *Bernhart-Fetter* patent, which described a program to plot two-dimensional figures of three-dimensional objects.

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'Brownout' Warnings Spell Gloom for DP Installations

By Thomas J. Morton
CW Midwest Bureau

CHICAGO – A reduction in the power received from a local power company might just mean a dryer that didn't quite do its job for a housewife or just a slightly dimmer lobby to a company's receptionist, but in the data processing center where voltage variations and millisecond power failures can make all the difference, the distant rumblings from the Federal Power Commission (FPC) could be storm warnings indeed.

Possible repercussions include input garbled, mainframes down and circuitry damaged, printout and remote CRT illegible, and data lost. Disk packs are scratched, memories are jumbled and full of errors. Servicemen are all away from their phones and the people who finally do answer them don't have the slightest notion as to when they'll be back, much less available.

Suddenly the DP manager finds out that he's not alone, others are in trouble too . . . which just makes things that much worse.

And to really put the topping on your cake, he realizes it is July and his environmental air conditioning has quit and he's going to be there for a long, long time.

Fateful Day

Mention "power failure" to anyone who lived in the Northeast U.S. and he'll remember Nov. 9, 1965 – that was a mechanical breakdown. Steps have been completed to guarantee that such a blackout can't happen again.

Although the rumblings of the Federal Power Commission are not saying "power failure," they're saying shortage and possible reductions. But a power reduction to a data processing center might as well be a failure.

Last month, the FPC released a survey

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Included among the DPMA's facility tour of the Pacific Northwest Bell's DP center are sights of the newly installed, IBM-compatible Datagraphix 4440 system that converts magnetic tape input to microfilm.

DPMA Opens Conference

Elliott Predicts Emphasis on Peripherals

SEATTLE, Wash. – The 1970 International Data Processing Conference and Business Exposition of the Data Processing Management Association (DPMA) opens this week in the Gateway City. Highlights include a three-day seminar program, a day of tours to various local DP operations, a film festival, exhibits, a special "ladies program," and an exciting entertainment program, topped off with the conference banquet, scheduled for Thursday evening.

In his prepared welcome speech to DPMA members, D.H. Warnke, international president of DPMA, said: "I believe that the breadth and depth of the seminars presented as well as the highest quality of exhibited equipment and products, will equip each attendee with the increased knowledge and skill needed to cope with the increasingly difficult problems confronting the EDP industry on

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Our Face Is Red

If you received a new subscription or renewal invoice from us marked "second notice," and you don't remember receiving a "first notice," you are right – you didn't. Because of a clerical error, no "first notices" were mailed.

If you received one of these invoices, please accept our apologies.

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Software Developers Receive 'Notice of Allowance'

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The program is in current use in a television commercial for Norelco electric shavers. An apparent cartoon is really a series of computer-plotted drawings, showing a man using and explaining the shaver.

Don Aldritt, president of Computer Graphics, said that he expected the issued patent to be printed "any day now."

Autoflow is generally regarded as one of the most successful software products in the computer field. It is installed in 1,200 computer centers. It was the first software product included in the government's General Services Administration schedule in 1966.

It was also the first software program to be selected by Industrial Research Magazine as one of the 100 most significant technical products of the year, in 1967.

According to ADR, Autoflow is also "most likely the first program to have produced sizeable sales volume."

Company investment is said to exceed $1 million, and total revenue since its introduction has been more than $6 million. Its use is also becoming worldwide, as the company reports that European sales are now growing significantly.

Autoflow is not the only debugging and flowcharting program on the market, but Goetz said that he did not think that competitive programs would infringe the upcoming patent.

He said that ADR had not examined all other systems very carefully, but "at this point, we don't think there has been any infringement."

He claimed that the patent would help potential customers "realize the difference between our system and any competitor's."

He said that, despite the fact that "on the surface" Autoflow may resemble some of its competitors, "we have many unique features, and those are the features that we've patented."

Goetz added that the patent application made 45 claims, and that all 45 claims will be allowed.

He also said that the patent would be granted for "the original Autoflow with improvements." The original program was modified in 1968, and "there is nothing else we're planning on claiming."

Goetz foresees no alteration to the pricing structure.

Autoflow, leased on a three-year basis, is said to increase the efficiency of computer programming and documentation, resulting in cost and personnel savings for users.

The Autoflow principle in the patent application was actually described in the form of a flowchart, according to Goetz. Thus, the patent does protect the software embodiment of the principles.

There was no description of hardware or circuitry, although the application was required to show a computer in a diagram, also indicating input and output, plus the temporary storage needed for the program.

Goetz emphasized that the patent is "truly a software patent," in that the claims "describe the logic in the form of a flowchart," as opposed to circuitry.

The patent, in effect, constitutes an epilogue to the long saga of the battle for program protection.

The last chapters were written last November, in the *Bernhart-Fetter* decision by CCPA, and again this Spring, when CCPA ruled that technical language could be used in describing the various claims in a patent application.

Now, the patents have been granted.

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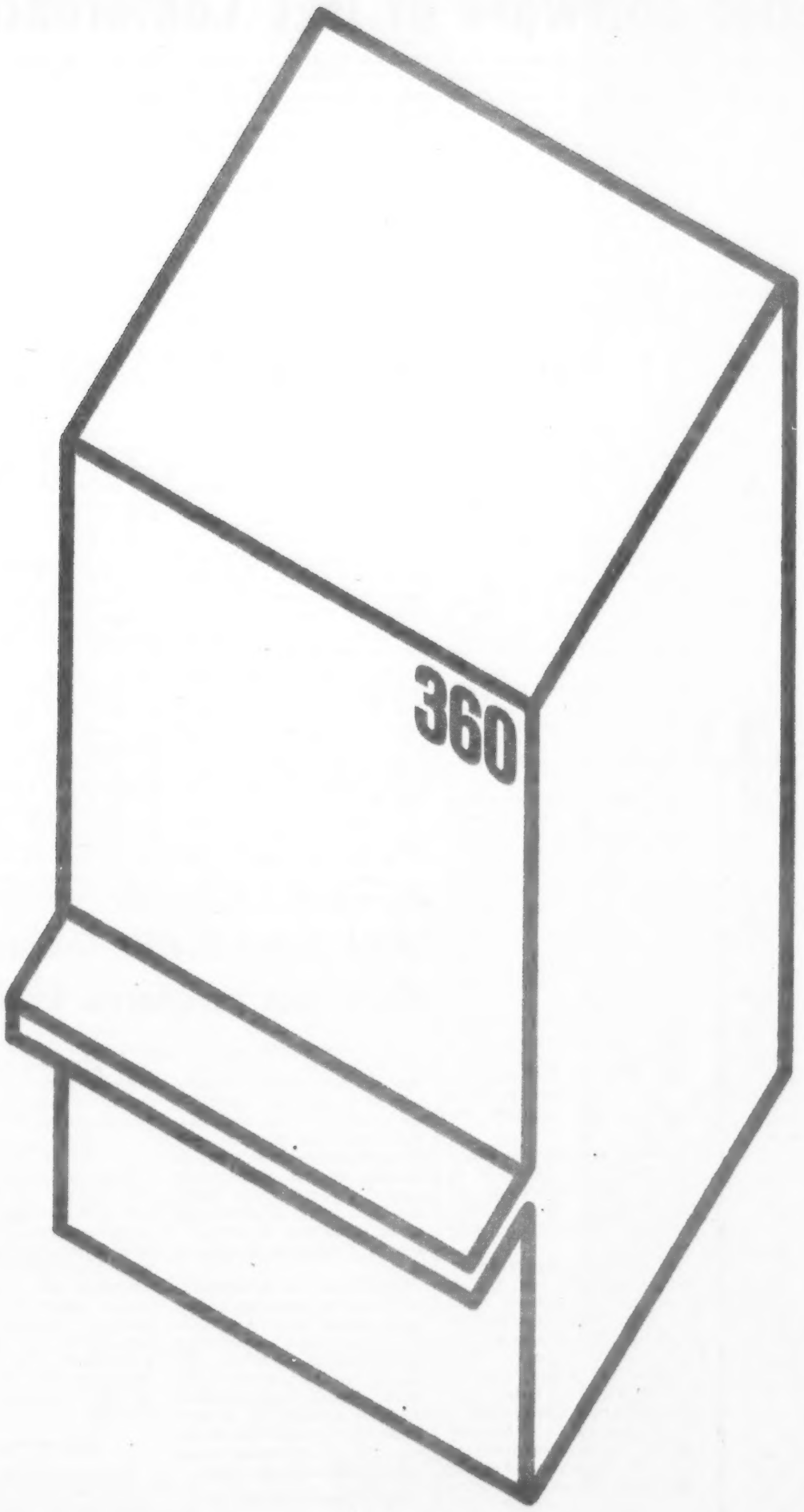

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Users Demand Better Software at IEEE Conference

By Drake Lundell
CW New York Bureau

WASHINGTON, D.C. – Some computer users invaded the engineering world at the IEEE Conference here and told engineers to consider user needs in designing computer systems.

The IEEE computer group show, which drew about 1,500 attendees and 40 exhibitors, is traditionally involved with the frontiers of circuit and memory research.

Sessions this year covered present research and future advances in memories, terminals, and peripherals.

Users, however, pointed out, in the words of one, "We don't use circuits, we use computer systems."

Philip H. Dorn, manager of Advanced Projects for Union Carbide Corp., told the engineers that "building faster circuitry doesn't help us that much. We need better software."

Dorn, a panelist at the highlight session on tomorrow's technology and markets, pointed out that many users can "do good computing with lousy hardware if the software is good."

Another panelist, Herbert R.J. Grosch, formerly director and now a senior research fellow at the National Bureau of Standards Center for Computer Science and Technology, told the group that the technology already developed today is very poorly used.

'Abominable'

Grosch said: "There's a fantastic technology bursting forth," but added that software people were "abominable."

The hardware sophistication, Grosch said, is overwhelming the software people. He said that each new computer generation had only been used one tenth as well as the preceding generation.

Grosch said that new generations were attractive to users because the hardware technology allowed them greater computing power even if the machines are not utilized to their theoretical capacity. In addition, he said that "IBM proved that almost anything can be sold to a lot of people."

Grosch said that problems with new systems are due to poor management of software personnel and software projects. He said layer upon layer of bad software has clogged the hardware development under way.

In defending software development to date, Werner L. Frank, president of Informatics, Inc. indicated that the government has supported hardware development almost exclusively and indicated that the federal government should hear the user's cry for help. Government research projects to develop better software, he said, should be started immediately.

Better Software

Frank indicated that better software will be developed as more programming aids and tools are designed to facilitate the programming production tasks. In addition, he indicated that the 70s would see the embodiment of more software capability in the hardware itself.

However, Frank admitted that "these efforts will, at best, serve only to contain the software cost explosion."

Another panelist, Patrick J. McGovern, president of International Data Corp., indicated that "manufacturers must meet user needs" in order to take advantage of the growing market in the 70s. McGovern indicated that 1% of the commercial facilities in operation today have some sort of in-house computer system. Another 1-1/2% of present industry uses some computer service, he said.

To reach the large market still untapped McGovern said manufacturers must employ technological advances to make computers available to the smaller company presently without computer service.

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News Editor
V.J. Farmer

Technical News Editor
Ronald A. Frank

Staff Writers
Edward Bride, Peter Carr, Judy Dick, Harvey Elman, Leslie Flanagan, Donald Leavitt, Christine Magnuson, Michael Merritt, Anne Nolan, Frank Piasta, Sara Werman.

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FPC Warnings of Brownout Spell Gloom

(Continued from Page 1)
that indicated as of May 31, 1970, there will be a reserve generating capacity of 15.9% in the continental U.S. The FPC said that 15% to 20% reserve generating capacity above peak loads is necessary to handle all contingencies.

The same survey went on to point out that of the 3,500 plus utility systems in the country, a third of them did not have a reserve capacity of 15%, and that some companies had no reserves at all, with a few in the reserve red. The FPC claimed there could be "potential systemwide and companywide problems in every section of the country."

The Office of Emergency Preparedness (OEP) wasn't much more encouraging in its report last month. It predicts trouble for the Eastern seaboard and the Midwest, citing New York, Chicago, St. Louis, and Minneapolis-St. Paul as potential trouble spots.

Closest to darkness is the Southeastern U.S. with a reserve generating capacity of 11.8%. The northern Midwest is close on the Southeast's heels with a low 12.7%.

Minneapolis-St. Paul could be in the most trouble. It has a 2.6% generating capacity deficiency.

A FPC member has said a "national power crisis" is already here. "Brownouts are highly likely," he continued, "Especially if this is a hot summer."

A brownout occurs when the utility reduces the voltage to its customers. A brownout could dim a light bulb. It could also slow the RPM of a tape drive and cause garbled data.

William McGowan, national service manager for Data Action Corp., when asked what a brownout could do to his company's key-to-tape inscriber, said: "Our equipment takes voltage from 105 to 140. If the power was reduced below 105, we could be in trouble. Logic would be affected. A 1 might become 0, things like that."

At IBM, Dale Sheets, senior installation planning engineer, said that IBM equipment would shut down automatically, if there were a severe power reduction. "It could cause some damage to circuitry, however." He added tape drives and disks could slow and "data would jumble.

"By the time you'd notice a dimming light bulb, it would be too late. A good indication of a power reduction would be a series of data errors. Most people wouldn't think to check the power source. They couldn't check it, not unless they had an external power meter," Sheets said.

Robert Witmer, field service manager of General Electric in Chicago, said: "The equipment would shut down. The under/over voltage sensor would turn it down. But there is always the possibility of circuit damage with an emergency shutdown."

A spokesman at Univac said: "Our under/over sensor would shut us down. The circuitry would take it, but there could very possibly be a loss in the memory cabinet due to a shutdown before the cycle was through.

A telephone survey of computer manufacturers and some of the larger independent service companies indicated that a brownout would, at the very least, cause some memory losses and data error. In some cases, mainframe circuitry could be damaged. Input systems would shut down, but not before data error was entered. Print out and CRT would show correct data incorrectly.

Precautions

Since the damage would be done before anyone could sense it happening, large equipment users are taking steps to protect their systems.

At the United Airlines' reservation center in Chicago, a protective system of auxiliary power was installed. If commercial power cuts off or is reduced, sensors pick up the variance and a diesel-powered generator takes over to supply power. A huge flywheel, running on provided power, supplies inertial power to the generator for the few seconds it takes for the diesel to automatically switch on.

DPMA Opens Seattle Conference; Elliott Sees Peripherals Emphasis

(Continued from Page 1)
the threshold of a new decade."

In line with industry trends, most of the exhibitors are showing peripherals, and some are introducing new products. Addressograph-Multigraph Corp. is showing its new Model 9639 scanner, a mark/bar code reader. Burroughs Corp. is introducing its DC 1200 data concentrator and its N 7000 key-to-tape inscriber.

Wilson Jones Co. is showing a new line of microfilm and microfiche storage units. A.B. Dick Co. is presenting a production model of its model 975, a CRT display unit that provides copies of the printout. Engineered Data Products is exhibiting its new model 1720 Swinger disk storage unit. 3M is demonstrating its Black Watch computer tape.

Significant Developments

In a review of significant developments in the industry over the past year, R. Calvin Elliott, executive director of DPMA, listed among the most prominent the present business slowdown.

"It has demonstrated that EDP, like other industries, is vulnerable to changing tides in economic affairs. In some cases, for an industry accustomed to a continuing and sometimes dazzling rate of growth, this has been an unpleasant pill to swallow, he said.

"The tight money situation has brought about a number of mergers, smaller companies are faced with a lack of capital for expansion purposes, and the formation of new companies has been slowed or deferred.

Saving Features

"However," Elliott continued, "the adverse economic factors have been accompanied by some saving features. The industry has been forced to concentrate on basics in efficient production, in marketing, and in greater customer satisfaction. The 'unbundling' move was unsettling but undoubtedly will contribute to a more competitive, future atmosphere for everyone's benefit, the manufacturer and the user alike.

Future Emphasis

"The year ahead is likely to see a continuation of the transition from the emphasis on mainframes to a greater stress on peripherals, especially terminals," he said. "Also, there should be a greater emphasis on the quality of programming.

"The expected imminent introduction of a new generation of computers will further advance throughput and miniaturization technology and better cost performance ratios. The accent will be on 'more for less money.' Among other things," Elliott said, "increased importance will be attached in coming months to the caliber of EDP management personnel.

Dick Bray of
NCI Dallas says

"Don't cling too long to the old ways"

"In every generation, there are those who move to the new technology. The new ways of doing things faster and more efficiently.

"And there are those who continue to stay with the old, familiar ways that seem so natural. The ways that were once exciting but are now, by comparison, slow and plodding. Expensive in time, in energy and in money.

"Don't stick with the old computer languages too long. If you do, you may find the industry has passed you by. Simply because others may be able to do the same work far faster, at a far lower cost, and put jobs up and running more quickly.

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Massachusetts: Its Innovations and the DP Quagmire

By Edward J. Bride
CW Staff Writer

BOSTON – The controversies over Massachusetts data processing have been many these past few months.

Most of the problems came to light when the state administrator released a comprehensive and damning report late in March [CW, April 1].

The report charged mass misuse and underuse of the state's three dozen computers, as well as personnel incompetence and a severe lack of adequate administrative procedures.

While the report was careful not to name agencies, some troubled state offices have been exposed by their own doing.

The Welfare Department computer was blamed recently for holding back some 600 checks from public assistance recipients.

Welfare officials explained that the problem lay in the workers or, if you will, in the system. An assistant welfare director stated that necessary changes simply were not entered properly, or on time, or both.

Nonetheless, dozens of social workers continued to blame the computer – "attack" is how one paper reported it – for withholding checks from their clients.

The Massachusetts Registry of Motor Vehicles has run into complex problems in its collection of excise tax on automobiles. The state bureau is to process and help administer the excise tax program for the various towns and cities which reap the dollars.

But a hitch developed in the "system" used in billing drivers for their excise tax here.

The system may be a common one, but it can nevertheless be quite uncomfortable to have to pay two bills, each $100 plus, within weeks of each other.

That's the hitch. A motorist registers a new car, and waits anywhere from two to 10 months for his excise tax bill to "get into the system."

Next year's bill, of course, comes right on time, meaning from 10 to two months later. Both bills are payable within 30 days.

Outside Keypunching

The administrative procedures involved in letting an outside keypunching contract have caused some delays, according to Deputy Registrar Robert Capasso.

Additionally, Capasso said a 3% error rate is acceptable, in fact "better than we could accomplish in-house." So nearly 100,000 of the state's three million drivers had mistakes on their excise tax bills this year.

They were mostly small mistakes, like getting assessed for a Volkswagen instead of a Volvo, which most drivers could put up with.

The coding used takes only the first three letters of the name.

Thus, Mercedes Benz automobiles get assessed as Mercurys, also "OK" by most Mercedes-Benz drivers. But the sparks fly when the *vice* becomes *versa*, and Mercury drivers are assessed for two or three times *their* automobile's value.

It takes another computer run, plus some hand shuffling of cards, to straighten out the process . . . plus, of course, valuable time.

Outside keypunching is also costly. This year's excise tax stubs are punched in Texas, to the tune of about $200,000 . . . the cost of making two cards for each of the three million drivers.

A new contract has been let each year – no such thing as a three-year deal. So, as soon as one company becomes familiar with the system, it has to resubmit a bid if it wants the next year's contract.

An official of the registry's computer center said that outside keypunching was done for Massachusetts "in practically every state in the union," since there isn't enough in-house ("in-state?") capability.

New Billing System

Capasso said that excise bills will be meted out on a staggered basis soon, instead of during January as in the past.

This will reduce the volume of keypunching to about 60,000 records a week, from approximately 12 times that much. The old system caused the need for keypunching elsewhere, and processing here in Boston, causing congestion, confusion, and frustration.

Sour Note to Innovation

Just last week CW reported how the ingenuity and innovation of the Secretary of the Commonwealth saved perhaps $50,000 by using free computer time to organize his records on various inactive or tax-delinquent corporations.

The file reorganization resulted in a billing by the department for nearly $1.5 million in back taxes or financial-statement-filing-fees, which would have been uncollectable if the agency had to manually update these records.

But the reorganization is also generating legal fees for attorneys of corporations which were in fact not delinquent. The notice, sent to all corporations which had failed to file their "certificate of condition," threatened dissolution if they did not comply.

Included in the addressees were all companies formed in the past year, and many companies whose fiscal year had not ended, or whose certificate of condition was not due since their annual meeting had not been held.

Corporations Director Michael D'Avolio said that this circumstance, reported as a "computer error" by most local papers, was built into the system. He said the mailing list was compiled by subtracting a list of companies which had filed their statements from the master list of corporations.

Some companies erroneously dunned by the commonwealth's computer are merely nodding their heads at this latest fiasco, but others are running to their lawyers to "save" them from involuntary dissolution.

FBI's Computer Quite Active

WASHINGTON, D.C. – The FBI's National Crime Information Center's computer houses almost two million listings in its file, including fugitives' names and registrations on stolen vehicles, guns, and securities.

The computer began nationwide operation in January, 1967, and handled 14 million transactions in 1969.

There are now 92 terminals in 49 states, including those in Hawaii, the District of Columbia, and with the Royal Canadian Mounted Police.

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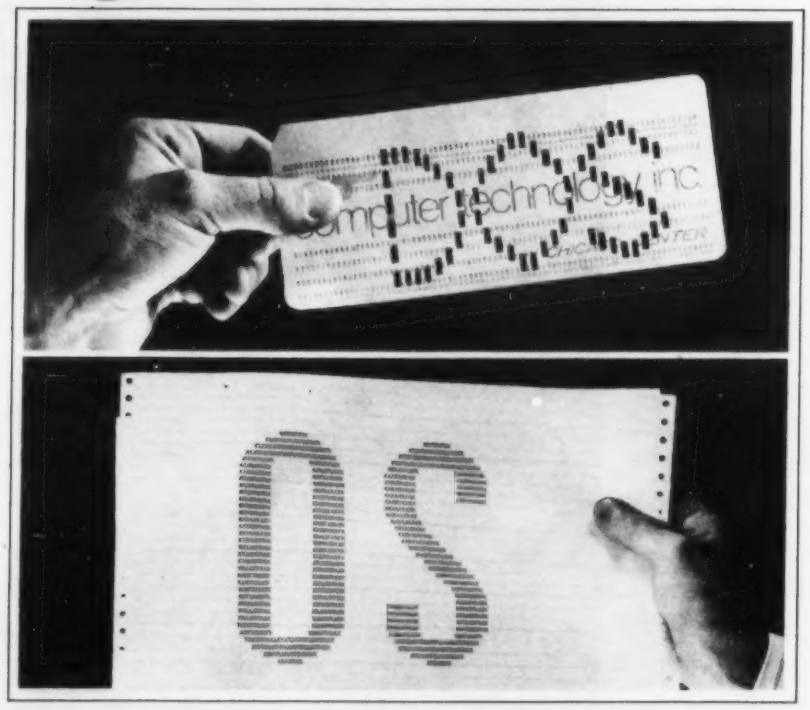

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Limiting Access to Centers a Major Security Problem

(Continued from Page 1)

winking and blinking lights, the clean looking, tastefully done facility," Scoma said.

"But upper management does not realize the DP center is actually the nerve center of the company, and is vital to the organization's daily operations.

"How many banks put their vaults in the front window? How many financial institutions let visitors wander through the safe deposit boxes?" Scoma asked.

Limiting access to the computer center is a major problem for security consultants, Scoma noted.

"Every employee with access to the company's data center and computer facility should be given a security check, including the night cleaning crew," he said.

"No matter how elaborate, ironclad, or costly the security system may be, it is no better than the integrity of the individuals working there," he continued.

Wasserman advocates security checks on computer room individuals every six months. In addition, he said, the responsibility for preserving the privacy of confidential information should be reviewed with them periodically.

"But these precautions are, of course, not necessary in every instance," Wasserman said. "The degree of security depends on the degree of vulnerability."

Mafia Problem

"In the production of credit cards, for example, tight security precautions should be taken, because there is a Mafia problem in this area. This probelm is predominant in the banking community, since banks prepare and mail out credit cards," he continued. It would be relatively simple to add a few names and addresses to get the cards to the "wrong" place.

Most corporations have standard operating procedures for computer room personnel. but the enforcement of these procedures is often lackadaisical.

"Management may put up a 'no smoking' sign, but will not enforce the regulation stringently," Wasserman said.

"Programmers are often allowed access to the computing room of many companies, especially in the late evening or early morning," he continued.

"They should not be allowed access, because, generally, they are in an unsupervised capacity, and there is no real necessity for a programmer to go into the computer room, especially with third generation equipment," he said.

"Unless there is a sophisticated degree of supervision, the only people who should be allowed access are the managers and the operators," Wasserman noted.

"Additionally, you find all too often that an operator, or tape handler, or programmer is going to be fired, and is given two weeks' notice. Many cases have arisen," he continued, "where disgruntled employees have sabotaged the system by erasing tapes.

"One individual in California simply took off all the external tape labels. Rather than giving two weeks' notice, employees should be given severance pay and denied access immediately," Wasserman said.

Conventional security at most installations today can be broken. Management can discover this themselves, Scoma said, by having people masquerade as repairmen, cleaners, or guards, "and see if they are challenged by any of the personnel working in the facility."

Security Conscious

The extent to which personnel are indoctrinated in being security-conscious is a concept that is repugnant to many professional people.

The typical systems programmer would probably think it most inappropriate for him to challenge anybody he does not know, even in a non-hostile manner, Wasserman stated.

"But indoctrination of personnel is important, if only because their job, if nothing else, is at stake," he said. "A programmer would not want to stay awake for many nights in a row to recover from some malicious mischief."

"In some circumstances, and depending on the type of work being done in the center, a system of badges may be an effective method of curtailing unauthorized entry," Wasserman said.

Double-Door Entry

Among the devices Scoma has developed to thwart computer theft and sabotage is an electronically controlled double-door entry system from corridor to computer center.

Once a person enters the first door, he is subjected to an electronic search by concealed probes for magnets and other potentially dangerous devices. If the person brings a magnet into the buffer zone between the two doors, the electronic scanning device detects the magnet, freezes the lock on the second door, and automatically alerts the company's security guards, Scoma said.

Only one person at a time can enter the buffer zone, which prevents a mob from entering the center. The security guard can also switch on his closed circuit television to look at and talk to the person trapped between both doors. If the person has no magnets or other devices, he can open the second door by means of a badge key, he said.

Conversely, the system will signal when someone attempts to remove a reel of magnetic tape from the computer facility. A special label is affixed permanently to each reel, and it cannot be taken from the facility without triggering the alarm, Scoma said.

High School's EDP Dance

PAINESVILLE, Ohio – Students from Painesville city and township have been invited to a computer dance. To help them get acquainted, there will be matching of likes and dislikes via a computer.

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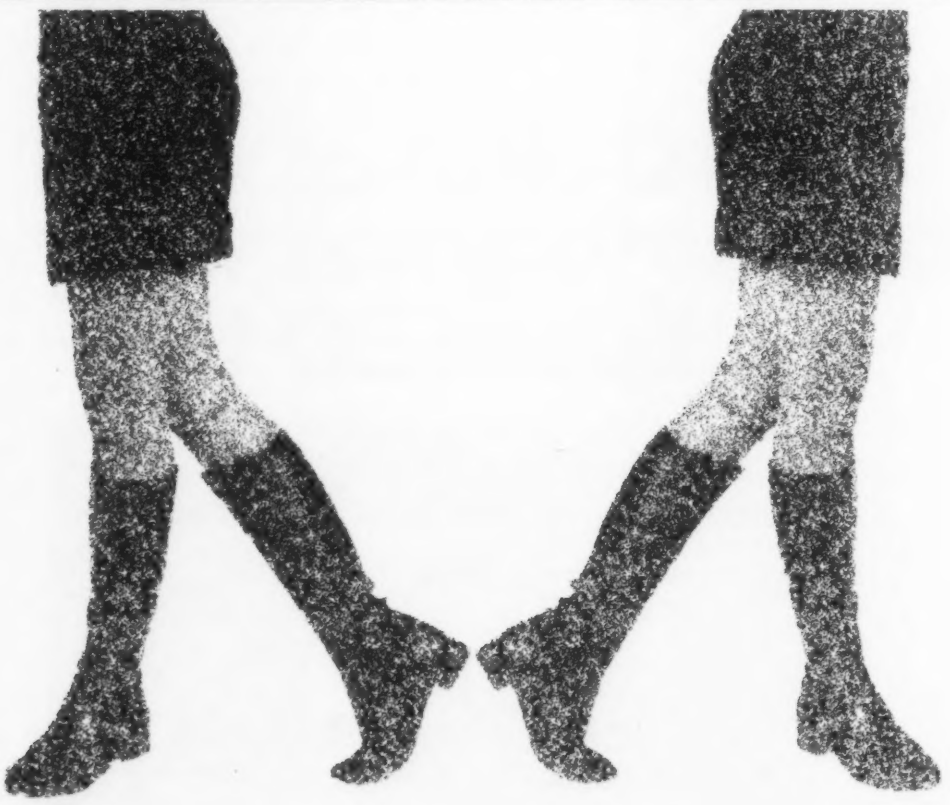
PITTSBURGH, Pa. – The Pittsburgh Steelers will begin the processing of all season tickets by computer.



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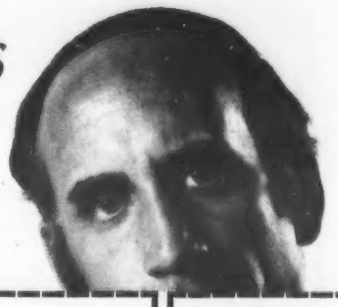

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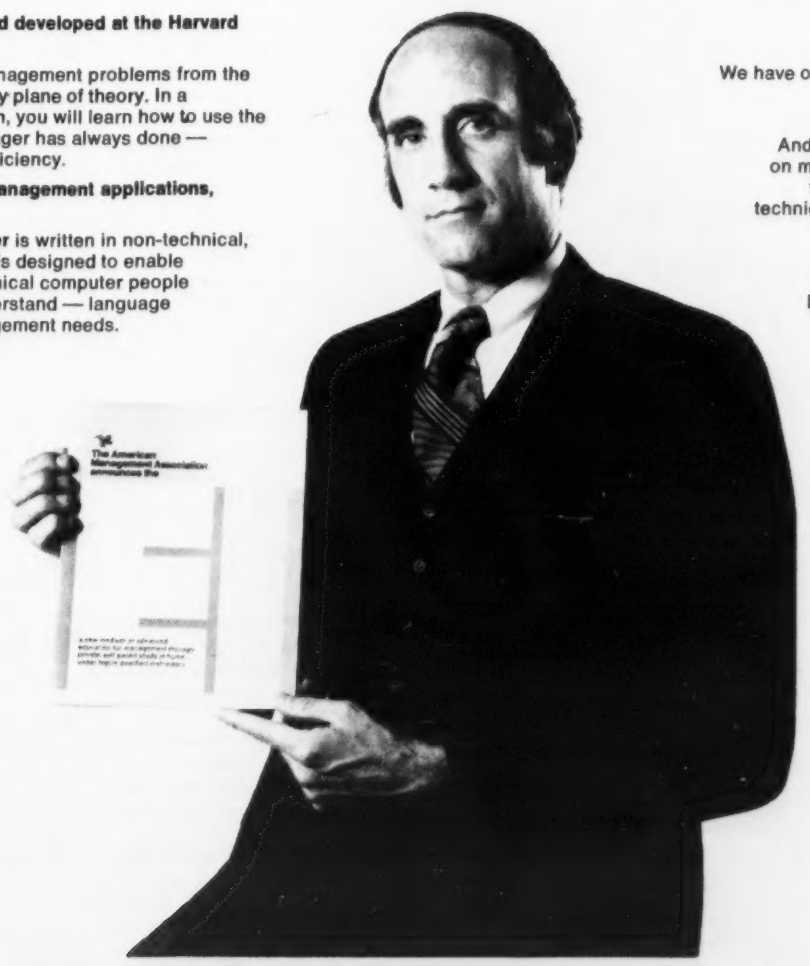

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We have often seen consultants' reports which relate the success of computer utilization to the degree of management participation in defining the systems requirements.

And since the full impact of the computer has yet to be felt on management operations, it is of greater import than ever that a thorough understanding of modern management techniques and objectives exists at all levels of management.

Computerworld is pleased to recommend **Management and the Computer** to its readers as an effective aid in bridging the opportunity gap between management and data processing executives.

Patrick J. McGovern
Publisher of Computerworld

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COMPUTERWORLD

Editorials

Output Control Improves

We were very heartened to learn that the FBI has cautioned users of its National Crime Information Center not to accept the center's output as gospel [CW, June 17].

Noting that criminals often use the lost or stolen identifications of innocent persons, the FBI stated that recipients of output must use "sound police judgment . . . in deciding on a proper course of action."

In other words, a positive identification from the system is not the same thing as proof that the suspect is a fugitive or even that he has a record. It is up to the police to balance the computer output against other evidence before acting.

We congratulate the FBI for printing this warning in its NCIC newsletter, but we still think a warning should be printed out each time the FBI system, or any other system, produces potentially harmful output.

"I Never Feel I've Done a Day's Work After These DP Jobs."

Letters to the Editor

We All Could Use A Self-Evaluation

Mr. Brandon and Dr. Hamming are sounding out about a point that disturbs them [CW, April 8]. Perhaps because they are the first to voice such an opinion and both are respected individuals in the computer field, it would be worthwhile to at least consider their comments.

Both men know that the majority of programmers are interested and concerned practitioners. They would both agree, I am sure, that we have come a long way with the programmers who have done commendable work up to this point. But both men are indicating that all is not as it could or should be, and now is the time for those dedicated programmers to demand performance of themselves and their management towards a more professional approach regarding their activities.

It is true that in some areas the programmers are performing in a substandard way, but is it entirely the programmer's fault, and is he unwilling to change, or would he gladly respond to a management that is both demanding and just?

Is it fair to hire a highly qualified programmer, have him complete a project that was difficult and demanding, then leave him on the maintenance of the system because it is safer from a management standpoint to do so, or is it tougher to turn the system over and move him on to another difficult job?

Do we hire a high-priced programmer and back him up with a three-day turnaround on compilations and tests? Have we promoted our best programmers to managers and have we equipped them in no way to be able to manage effectively?

We all know outstanding programmers who have done and will do the job. We also know that 10 years of unfilled requisitions for manpower find us with some very grave weaknesses in all organizational levels surrounding the computer.

It is not just the programmers but all of us who can use a critical self-evaluation, because if we do not, and if we do not change, we will be changed by others. We can act upon the criticism levelled by Messrs. Brandon and Hamming and be glad the criticism came from those amongst us rather than from the outside.

Leo F. Miernicke
Director, Computer Centre

University of Windsor
Windsor, Ontario, Canada

Systems Analysts and Personal Interviews

The series on systems analysts by Milton Spett has been interesting. While utilizing EDP services in a variety of business functions, I opted for systems work because I was impressed by the intelligence, drive, character and organizational position of the many good people I encountered in this profession. Mr. Spett has described the best of these people in defining good analysts.

Further, Mr. Spett's articles have been logically sound until he ran into difficulty in the last paragraph of Part III [CW, May 27], dealing with personal interviews. To steal from the programmer's lexicon, if his essay had been a Cobol program it would have fataled, blown-up, and/or dumped core.

While I agree with his statement noting the importance of the words used by an interviewee, his linking of attention to appearance with "an overwhelming desire to please everyone and therefore (be) afraid to show the aggressiveness and imagination needed to do the job" is *argumentum ad absurdum*. Although I will not develop categorical syllogisms for him, Mr. Spett stated in Part II that "a large part of the systems analyst's work involves dealing with people." Even if the importance of good dress is restricted to first impressions, lack of this consideration could very well be an insult to the user.

If in fact Mr. Spett, a DP manager, has never met tough-minded, self-confident individuals who deal with people (users) in a considerate manner, I am surprised and indeed regretful that I could not count Milton as fully experienced in an interview.

Fred Sanson

EDS
Minneapolis, Minn.

APL as Easy-to-Learn, Primary Language

In his letter to the editor [CW, May 13], Kenneth Gilbert praises APL, but claims that APL's different character set retards acceptance by experienced programmers. I am happy to be able to dispute this claim.

Computer Innovations has offered commercial APL time-sharing service for the past year. The reception has been enthusiastic from programmers and non-programmers alike.

We find APL to be rich, like the English language, rather than complicated. Its modularity allows novices to start with a small subset, and expand their "vocabulary" of APL operators as their needs and interests suggest. Indeed, our experience has been that APL, when properly presented, is so easy to learn, that even people who had previously resisted the computer in any form are often won over.

Our experience to date also seems to point to a conclusion other than Mr. Gilbert's as to the main, future role of APL. Because APL is so powerful as a notation, users soon find themselves thinking in APL. The inevitable result, we conclude, is that much of APL's future importance is as a primary language.

Joseph Mill
President

Computer Innovations
Chicago, Ill.

SJCC Session Was Disrupted by Outbursts

The headline article of May 13 by Drake Lundell, covering the SJCC, said: "Disruptive tactics were completely absent from the show," referring to the upsurge of student unrest over the Cambodian decision. For the record, the very first session of the show, "Multiprocessors for Military Systems," was disrupted by frequent outbursts from several members of the audience.

Also for the record, I am an "under-30" Computer Professional for Peace, but not at any price, especially the price of liberty. I am in complete accord with our President's decision and have written him so.

Bob Matherne

Los Angeles.

The Decline of Basic

The article on the decline of Basic by Elaine Bishop [CW, June 3] implies, incorrectly, that APL lacks the matrix operations of Basic. Indeed, the exact reverse is the case, since virtually all APL keyboard operators operate directly on arrays, while those of Basic, along with other languages, generally do not.

Joseph Mill
President

Computer Innovations
Chicago

When Data Banks Are Opened to Outsiders...

Who Will Pay for the Use of Other People's Data?

The Taylor Report

By Alan Taylor

There are coming to be more and more data banks around. Each time a new one is created then a new resource becomes available, both for its owners and for others.

For their owners the resource is obvious, and the understanding of what the base actually contains, its reliability and its adequacy, has already been measured and found good for its designed purpose.

For other people, who now can consider whether it is worth their while obtaining access to the base, the actual resource itself can be understood; but the value and adequacy of it may very easily be misunderstood. And herein lies a problem – if outsiders who do not have first-hand knowledge of where the data in a data base comes from and yet try to use it.

Used, Not Understood

Yet it is inevitable that they will use it. When a knowledge resource becomes available, which on the surface appears to be of value, then outsiders are going to object to spending money in trying to find out about the same data – assuming that they feel that they can get access to it.

Somewhere in their charter or mission they know there is the phrase "as economically as possible" or "provided that it can be economically performed" or something like that. This insists that they buy from the cheapest source and that they buy if there is any economical source at all.

And trade will therefore spring up in the information used in the base. Quite a lot of trade, too, considering the actual small cost of answering further inquiries into an already operational and maintained base. This cost is low, and it is quite easy to sell the information for considerably more money – or for mutual interchange of information – or for something like that.

Indeed, as we have seen in the Welfare Bill the existence of such data bases almost puts a duty on outsiders to use them even for fishing expeditions – just in case someone is cheating.

Resources Should Be Used

Now, it is no part of my idea that use of these various data bases should be restricted unnecessarily. Where it is economically advantageous to both sides I would like to see more use being made of any existing resources. With, however, one vital proviso.

And that is that anyone using data gathered by other people should insure that facts on which they base any potentially hurtful action or decision are really true – before taking any such action.

Let us take a case – a rather standard case I am afraid. The post office is checking out applicants for a postman's job, and hears that one of the applicants was checked out by some other agency – say the Atomic Energy Commission. It obtains his record from the AEC, and notes that he was rejected for a position in 1953 because of a reported drinking problem of his wife's.

Now, there are two reasonable choices for the post office. It can; on the one hand, decide that this has no reaction on current appointments to the post office, or it can decide that it would have a reaction if it was true, and that it should therefore investigate the matter directly so as to avoid appointing an inadequate man for the job.

Don't Assume Guilt

But, for bureaucratic reasons, a third, unreasonable choice exists, which is to say that the report indicates a doubt of his fitness, and that therefore because of the doubt he is not to have the job.

This choice not merely exists, but is in fact quite a strong possibility because of the problem of having to defend any appointment later if it does work out wrong, as any appointment may do. The bureaucrat must always think of someone coming out of the woodwork and asking, "Do you mean to tell me that with full knowledge of the AEC's professional opinion you still recommended this man as being suitable?" etc., etc. The power of hindsight is a fearful power.

Alan Taylor, consultant, writer, and former editor of *Computerworld*, is president of Computer Management Aids Corp. of Framingham, Mass.

Now, if this third choice is taken, then what has actually happened is that the cost of the post office using the AEC's data base has been paid NOT by the post office, but by an innocent man*. It has been paid because the post office did not control and select the information in the report so as to be suitable for considering a man for post office employment in 1970, but is reading that information into data collected against a totally different set of criteria – which criteria in most cases are never written down in full, and certainly are not any part of the data base.

Now, economy is all very well, and sharing data bases for economic reasons is good. But the cost of such operations should be paid by the people concerned – not by outsiders. And so the type of action which makes the cost fall on outsiders should be banned.

Preventive Technique

It can be banned – quite easily also. All that is needed is an agreement that before access is given to any data the outsider would agree that he will not take any action that potentially hurts anyone as a result of data obtained until true, current, facts are independently reinvestigated and that only these new facts – NOT the reports which may or may not be correct – be used in the decision-making process.

In short, the use of other people's data should be restricted to knowing where to go search, but not to be used as evidence. It simply is not – and probably never will be – of adequate standard to allow other people to be unknowingly and indefeasibly hurt.

*Innocent, rather than potentially innocent, is the correct objective here, because of the American rule that all men are innocent until proven guilty.

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Letters to the Editor

Handling Date Field Not a Typical Operation

Alan Taylor's article on Cobol overhead [CW, June 3] brought attention to a problem which has been easy to ignore. I am disturbed by Mr. Taylor's thesis that the Cobol Language is the root of the problem

Mr. Taylor cited inefficient Cobol handling of a group item, date field. Since manipulation of that field required three instructions when one could suffice, Mr. Taylor extrapolated the statistic that Cobol imposed 200% core and time penalty upon the user. That was not a rigorous evaluation, but the 200% figure takes the appearance of authority. The number is misleading; handling a date field is just not a sufficiently typical operation. No single operation is typical.

This example, and even Mr. Taylor's other example concerning representation of numbers, could be handled as effectively with Cobol as with assembler coding, providing a sufficiently "intelligent" compiler were employed. It would be quite possible to make a compiler handle the group item as an elementary item. For that matter, a programmer could redefine a group item as elementary, to force virtually any compiler to handle this manipulation efficiently.

Manufacturers seem to take two divergent approaches to the issue. The prevalent approach is to spew out a compiler without regard to efficiency. That attitude should be considered intolerable, especially in software. The minority approach is to embrace compiler languages, to design hardware for use with such languages. The second approach has been followed by at least one manufacturer, Burroughs, with the result that Cobol efficiency resembles assembler efficiency in B-2500/B-3500/B-4500 computers. Burroughs' B-5500 and B-6500 do not even have assembler languages.

Manufacturers should design hardware around languages users demand. If high-level languages are demanded, hardware should support those languages. Short of that, for use with current hardware, efficient compilers can be written within Usasi specifications. The language specifications themselves could use some improvement, but specifications are not the big problem.

Allan B. Ross
Programmer-Analyst
Walter E. Heller & Co.
Chicago

Cobol Overhead Cost: What Should Be Done?

Reference The Taylor Report, June 3, 1970, "Do You Know What Your Cobol Overhead Cost Is?" Mr. Taylor's conclusion that Cobol overhead may exceed 50% is reason for immediate concern, and action.

He does a good job of stimulating the concern but stops short of recommending the action. What can and should be done to get these deficiencies corrected? A suggestion by Mr. Taylor would have prompted user action, and concentrated pressure where it can be most effective.

R.P. Beairsto, Manager
Scholastic Group Data Processing
Josten's
Owatonna, Minn.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington Street, Newton, Mass. 02160.

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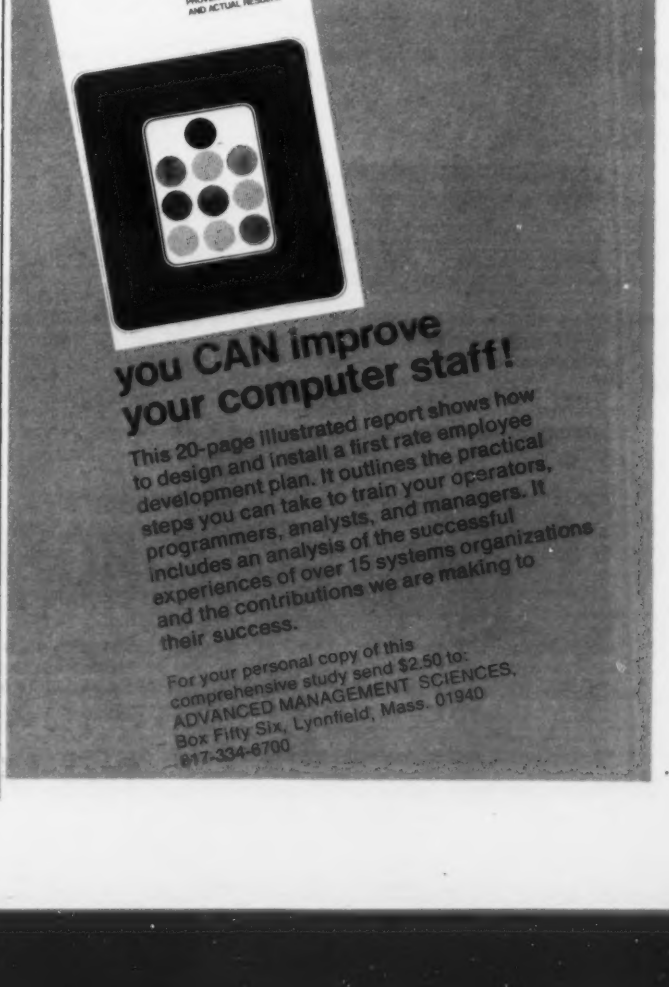
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Viewpoint

Project and People Control—Part III

How to Utilize Individuals Profitably by Proper Billing

By Elliot Raphaelson
Special to Computerworld

Project control is a must, a necessary, but not sufficient condition to insure profitability. For example, if each project is controlled properly, but many individuals are not profitably employed enough of the time, the firm may still be unprofitable.

This is the third article dealing with effective control techniques. The prior articles dealt with proper control over time and materials and fixed price contracts. The subject of this article is proper individual controls. Subsequent articles will be concerned with effective, intermediate and long-range planning.

If an organization is too loosely controlled, and individuals are transferred from one assignment to another sporadically, it is sometimes difficult to know which individuals are not being profitably utilized.

Figure 1 illustrates a sample weekly exception report which identifies all individuals who should be billable in the company who were not profitable during the prior week. In some situations, there is little that can be done. In many cases such a report will identify individuals who can be more profitably utilized.

Appropriate

In many consulting firms the company is not profitable enough because its people are not being billed out at appropriate rates. This situation can result because either the rate structure of the corporation is too low or too many individuals are being billed in the wrong work classification.

How do you determine the standard for a "reasonable" rate? This should vary within consulting firms based on the reputation of the firm, nature of the competition, etc.

In general, an individual should be billed at a rate at least equal to twice his gross salary. Thus, a man making $13,000/yr, who works an average of 44 billable weeks a year, should return approximately $120/day.

If he is assigned to a project that does not return an acceptable rate to management, he should be aware of the situation. Figure 2 illustrates a sample exception report that can be used for this purpose.

If more than 15% of a staff are not earning an acceptable rate, a potential serious problem exists, with many possibilities.

Overpaid

- Many staff members may be overpaid. There is no point in raising someone's salary to the point where he cannot be profitable. If an individual does not have the capability to do systems analysis work, do not pay him systems analysis wages.

In the long run the company will be better off losing a man who is not promotable rather than raising his salary so the firm cannot make money with him, and no one else can afford to hire him.

- The complete rate structure may be too low. As a consultant's reputation becomes sounder through experience, it becomes much easier to raise rates for all work classifications.
- The staff is overqualified for the jobs being done. This situation is most apt to occur in an organization that is not growing. If the content of the job remains the same and the staff members are being promoted, at some time the staff members will be overqualified, unhappy in their jobs, and the company will not be making a normal profit margin.

This situation is remedied by a marketing organization that is bringing in an expanded volume of business. In this way, there will be higher level jobs in the organization for the experienced staff members. The lower level positions can be filled by new workers with less experience.

Regardless of which of these categories a consulting firm falls into, there is no question that a reporting scheme that identifies the potential problem area of its inception is invaluable.

There may be an important side benefit as well. It is conceivable that a firm discovers that each individual is profitably employed by normal standards, and yet the company is not profitable. This would indicate that the administration expenses are too high for this type of business, and would suggest a close analysis of the expenditures associated in this area whether it is associated with personnel, marketing or other expenses.

Elliot Raphaelson is director of research and development for CGA Computer Associates, Inc.

Individual not being billed at least 60% last week.

Individual	Days Billed	Reason	Anticipated Billable Date
Joe	2	Completed job awaiting next assignment	2/15/70
Harry	0	Working on job which is overrun	3/1/70
Ed	0	Working on job which is overrun	3/1/70
Cindy	0	Awaiting next assignment	2/1/70

Figure 1. Personnel Billing Exception Report (Weekly)

Individual	Minimum Acceptable Billing Rate	Current Billing Rate	Reason
Jim	$13/hr	12	Temporary assignment
Henry	$17/hr	13	Does not have competence for $17 rate
Bill	$15/hr	13	Does not have appropriate job for assignment

Figure 2. Billing Rate Exception Report (Monthly)

A New Sidekick

CLEVELAND, Ohio – The Lake County sheriff's department soon will join a growing list of police agencies in Ohio and the nation with a tie-in to the high-speed, computerized Law Enforcement Automated Data System (Leads).

Leads has been in use for about a year in this area.

Computer Picks Musical

NEW YORK – Astroflash, the astrological IBM 360/25, predicted success for "Applause," the new Broadway musical, over a month before its opening.

The computer arrived at its prophecy by casting an electronic horoscope for Lauren Bacall.

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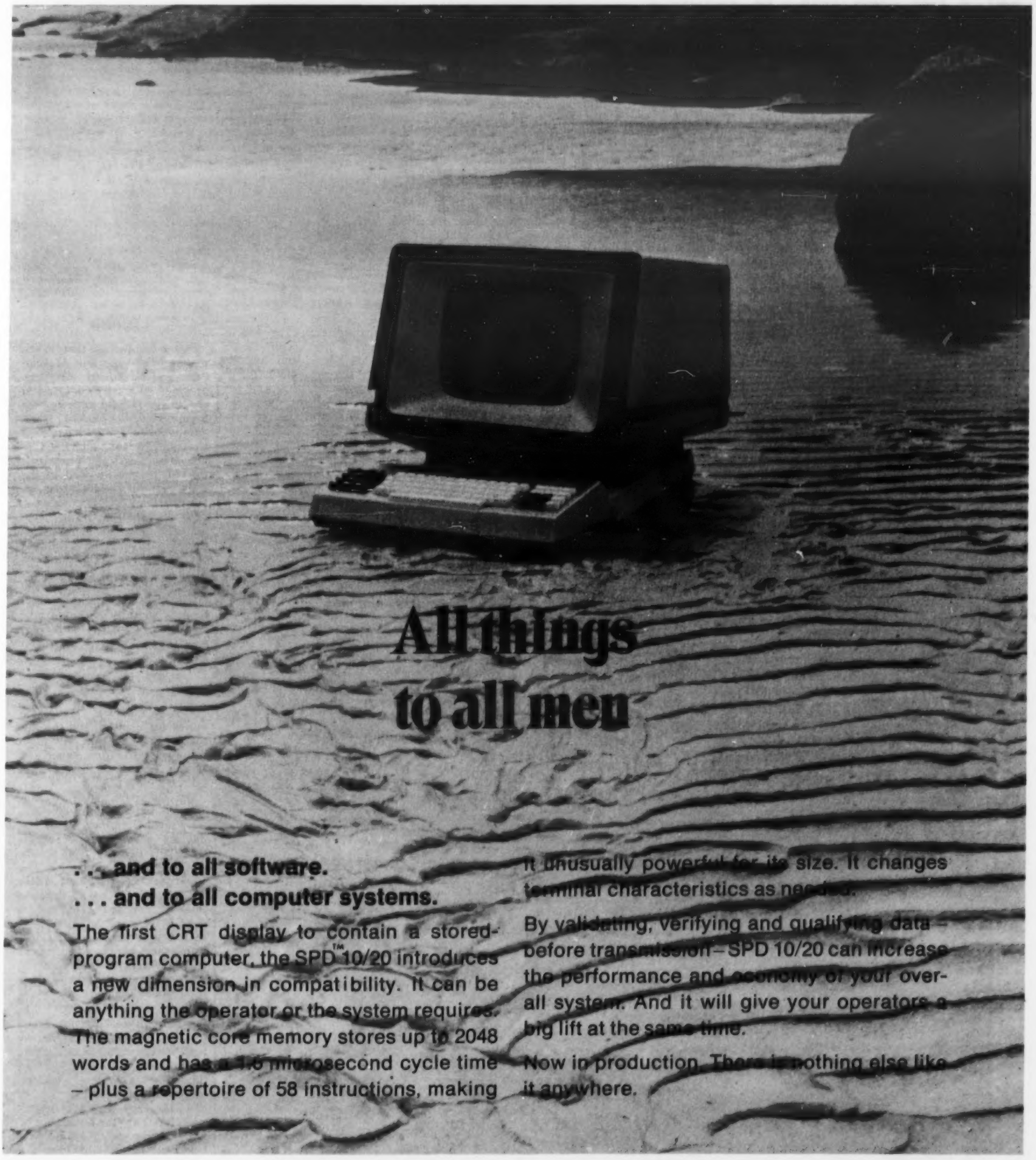
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EDP's Top Man Talks to Senators

Watson Urges End to War; Backs Wage-Price Guides

WASHINGTON, D.C. – "To continue as a great nation, our country must be drawn together. I doubt that this can be done while we're in Vietnam."

So testified Thomas J. Watson Jr., chairman of IBM, before the Senate Foreign Relations Committee early this month. The committee had asked Watson to discuss the economic impact of the war in Vietnam on the U.S.

Watson advocated immediate withdrawal from Vietnam, despite the fact that "it's impossible to figure out an efficient, orderly, and dignified way of getting out of Vietnam." He also suggested a return to wage-price guidelines as a temporary cure for inflation.

Confidence and Economy

The two main effects of the war Watson discussed were internal dissension and disruption of confidence in the American system, and the economic "overcommitment" caused by the war.

On the first point, Watson told the senators that the longer the war continues "the more it broadens the gap between the elder generation, sometimes called the establishment, and our young men and women, who will soon be responsible for the leadership and destiny of this country."

He added that "the prolongation of the war may well set up a continuing revolution of our youth through which they may become sufficiently demoralized so that the progress of our country will be appreciably slowed.

Alienated Allies

Watson also declared that the war is alienating our allies. He mentioned that "we present a picture of a terribly powerful, awe-inspiring nation unable to manage itself in a disciplined fashion."

Asserting that "our prestige is suffering abroad," he revealed that in the six weeks preceding his testimony IBM offices in West Berlin, Cologne, Holland, Argentina, Paris, and New York had been subject to violent assault.

On the economic side, Watson boasted that the U.S. is "the strongest country economically . . . that has ever been known to man," but went on to say that "we are just a bit out of gear. We wonder not only why we can't get out of Vietnam with dispatch," he continued, "but how we ever got into it and stayed in it so long. Our children wonder about our leadership, and we wonder about their ideals."

He claimed that "the war in Vietnam is the major factor which has turned our healthy economy into an unhealthy one. "Inflation always accompanies war and distorts an economy," he alleged.

The executive summarized: "We simply overtaxed our ability to produce," which caused inflation, and which, in turn, he explained, forced the government to find "a way of cutting down on demand. . . ." He praised the fact that the government "took [the] courageous and very necessary fiscal and monetary steps" to curb inflation.

Guidelines

Watson emphasized that "when we are completely out of Vietnam, much of our economic problem will be solved." He said that in the interim he feels "the Administration [should] give serious consideration to resorting at once to the guideline approach to wages and prices that worked reasonably well in the early years of the Kennedy Administration."

Watson reported to the senators the impression he gathered speaking with college students over the past year. He concluded that "there is absolutely no question about the sincerity and intensity of the dissatisfaction of the vast majority of these young Americans with the direction in which we are going in Southeast Asia."

'As Soon as Possible'

He cited the difference between World War II, which united the country, and the current war, which "has only lukewarm support from some and varying degrees of dissent from others."

The chairman remarked that "for all these reasons I believe we should withdraw all of our military activities, both operational and advisory, from Southeast Asia as soon as possible."

Watson stressed that these views were his own, and not those of IBM. At the IBM annual meeting in April he announced that despite repeated attempts from many sides to convince the IBM directors to denounce the Vietnam war, the corporation itself would remain neutral.

Though conceding the difficulty of the task, he noted two routes to explore; first, increased concessions at the negotiations in Paris, and, second, appeal to a third party such as the United Nations for help.

He sketched the benefits of withdrawal as "the resurgence of faith of our young people," "a better relationship between the Administration and Congress," unified support for the government, and "renewal of our military flexibility." He also listed "renewed respect and understanding from our . . . friends and allies."

In conclusion, Watson voiced "one man's conviction that we stand at a crossroad of decision, with all the comfortable routes closed off; that we must end this tragedy before it overwhelms us; and that we must therefore face up squarely to a tough decision and see it through with courage and dispatch."

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A pilot in a mockup of an airplane cockpit operates his controls to follow another maneuvering aircraft in a simulated flight environment.

Visual Simulation

Pilot Sees Environment Change on TV

BINGHAMPTON, N.Y. – A pilot, sitting in a mockup of an airplane cockpit, operates the controls and watches his environment changing on a color television screen as it would appear if he were looking out the window of a real aircraft.

What makes this simulation system different from most is that the picture is generated entirely by computers – there are no television cameras, motion picture film or videotape. The scene changes in response to the way the pilot maneuvers his aircraft.

Vess (Visual Environment Simulation System) is located at GE's Aircraft Equipment Division Avionic Controls Laboratory here. It was designed as a research tool and to demonstrate the possibilities of relatively low-cost, computer-generated visual simulation.

Vess accepts inputs from any simulation system and generates an accurate, full color, true perspective view of the three-dimensional environment described. The scene content of the environment can vary to include all aspects of simulation – from spacecraft flight to automobile driving.

GE explains that Vess operates in both real-time and non real-time modes. In real-time, the environment is limited to 24 edges – an edge being the intersection of two planes.

The 24-edge environment is programmed in the computer's memory, and as the observer moves through this environment, his view changes. The view is updated 30 times a second, compatible with television systems.

In the non real-time mode, environments of much greater complexity can be displayed. This is done by computing 24 edges at a time, and successively storing them on a video disk. In a little over four seconds, an environment consisting of 1000 edges can be computed and displayed.

The Swing's the Thing ... So Golfers Get the Word

LINCOLN, Neb. – Golf pro or weekend hacker, your idolizing of Bobby Jones is justified.

A human being searched far and wide for a picture of some golf player whose form most resembled a computer's idea of the most efficient golf swing, and that picture was one of Bobby Jones, using a No. 2 iron.

In a recent issue of the American Journal of physics, Dr. Theodore Jorgensen Jr., a University of Nebraska physicist, told how his study showed two areas for beginning golfers to improve themselves.

The study reveals that two common faults are too long a backswing and the improper flexing of the wrists.

Jorgensen used the computer to make various minute changes to a golfer's backswing, wrist angle, and other variables, in order to determine what combination of factors would yield the longest, straightest drive.

To the surprise of no golfer, and probably to no physicist, Jorgensen determined that the distance of a shot depends on the speed of the clubhead at the time of impact with the ball.

Flexing the wrists immediately before this impact will increase clubhead speed, Jorgensen discovered, thus making it possible for a proficient golfer – timing-wise – to drive the ball further than a much stronger golfer who starts the wrist action at the top of his swing.

This latter style produces about 75% efficiency, compared to the last-minute-flex, according to the study.

Reducing the backswing will make shots much more accurate, without sacrificing much clubhead speed, Jorgensen noted.

Joregensen said: "The proficient golfer does a sort of hesitation with his wrists, uncocking them just as the clubhead is about to contact the ball, part of that elusive quality called timing."

He also noted that the "pro uses much less backswing than does the duffer."

Single System Provides Focal Tool For On-Line Tractor Engine Testing

MINNEAPOLIS, Minn. – In the research department of the Caterpillar Tractor Co., a single computer system is a focal point for on-line testing and designing of engines for the company's giant earth-moving equipment.

A master software operating system enables the Control Data Corp. (CDC) 3300 to run multiple programs and serve multiple users simultaneously. Access to the computer is provided by a number of CDC 200 user terminals, one of which is 90 miles from the computing center.

The combination of software and computer capability has enabled Caterpillar engineers to solve problems of more than 2,000 simultaneous differential equations related to various aspects of analytical design.

One of the most scientifically oriented and complicated tasks performed by the computer is the processing of test data from gas turbine engines.

Engines undergoing tests are put on-line to the computer, which computes, normalizes, and edits test results as the tests are run.

A complex of data acquisition equipment and a data transmission device developed especially for Caterpillar by CDC transmit 200 transducer measurements to the computer. Turnaround time requires about 30 seconds.

Up to four engines can be tested simultaneously and served in turn by the computer. Each test produces a range of variable data for calculation.

While the computer reduces test data, engineers at remotely located terminals access the computer for solutions to various design problems.

A CRT installed in the turbine test laboratory displays programs and provides communication with the disk storage system for program change. Such changes are required to accommodate newly made system calibrations, a change of fuel test properties, notification of a burned out thermocouple, or a change in data requested for print-out.

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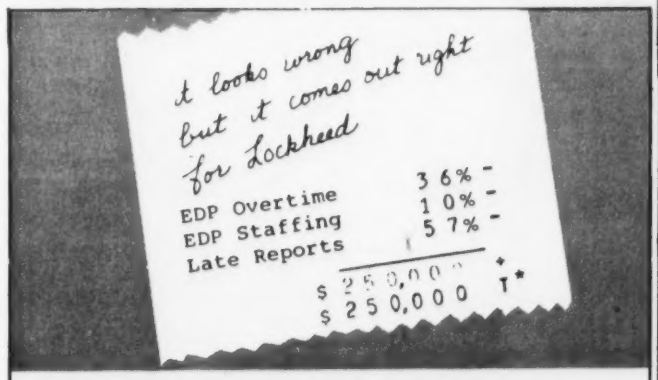

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First there is the *System Description* covering characteristics of language types and forms, modes of use, file media, documentation, etc. *Data Structure* includes types of groups, entries, files, and their identifications. *Functions* precisely defines the preceding items and also covers interrogation, selection criteria, file creation, etc. *Storage Structure* specifies storage representation for item levels, entry and group levels, file levels, and multiple files. *Operational Environment* gives details of basic and expanded hardware, software, and systems requirements. Prices are also provided.

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To satisfy that need fully, we had to make our terminal a full-scale device. We had to make it reasonably priced. And we had to make it light enough to carry and rugged enough to take a beating.

Our portable is called Envoy. It plugs into an ordinary outlet, uses an ordinary telephone and has full editing controls. It is easy to use and it is compatible with Teletype* systems.

It has the best acoustic coupler on the market, one that virtually eliminates noise interference in data transmission. It has a solid-state keyboard and a commercially proven TV monitor. It displays either 512 or 1,024 characters and displays them very clearly. And it has all the sophisticated operating features we developed for our large, stationary terminal.

It costs either $3195 or $3695, depending on character capacity and features. It weighs about 30 pounds and it fits under an airplane seat.

Now consider how it might be used:

By the time-sharing salesman to demonstrate his programs, routines and special languages.

By any salesman who needs information to close a sale, and needs it in the customer's office.

By the engineer on the job site.

By the scientist in the laboratory, by the programmer working at home, by the executive on a business trip.

It's worth considering.

*Registered trademark of Teletype Corporation

100 LET A = 5
110 LET B = 6. C o 7
120 INPUT A(1)
130 PRINT "YOUR DISCOUNT IS"
140 INPUT A$
150 IF A$ = "YES" GOTO 170
160 IF A$ = "NO" GOTO 130
170 PRINT
180 PRINT
190 PRINT "$ ";(2500 $$)
200 GOSUB 2000
210 REM ************************
220 REM START
230 REM ************************
2000 INPUT R$,S$,T$,L,M,N
2010 PRINT

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This is a desktop, stationary terminal called Consul. We designed it, engineered it and priced it to appeal to a broad cross section of the time-sharing market.

Consul lets you replace Teletypes with CRT terminals —plug to plug and with no changes in software.

But this terminal is capable of much more. It has the operating features that let you take full advantage of a CRT terminal and its inherent flexibility.

A formatting device, for instance, makes for fast, efficient data entry. The computer displays a form of fixed data. You fill in the blanks with variable data.

A look-ahead feature saves transmission time. It scans ahead and if there is no data on the rest of a line, the cursor goes directly to the next line. Which beats transmitting a lot of blanks.

Another point. You can use Consul in any of three modes—page, message and conversational. In the page and message modes, you can edit a whole or a partial page of data before transmission. In the conversational mode, data simultaneously appears on the screen as it is transmitted. Also, you can correct mistakes in this mode without retyping the whole line.

Several other details. The terminal has a 9" TV monitor. It has a built-in modem (optional) that can operate as an acoustic coupler as well as via hardwire connection to a DAA. It also has a plexiglas front panel that reduces glare.

Consul is available in three models. The Consul-800 displays 512 characters; the 840 displays 1,024; the 880 displays 1600 characters. They cost respectively $2995, $3495 and $3995. Pretty reasonable considering the equipment.

But, then, there are a lot of new terminals on the market. And there have been a lot of claims. The only way to judge a terminal is to see it working.

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Computer-Planned Menu Expected to Cut Budget

By Peter F. Carr
CW Staff Writer

MILLEDGEVILLE, Ga. – Despite rapidly rising food costs, Georgia's Central State Hospital expects to reduce its projected $3 million food budget by $150,000 by using a computer to plan its menus.

According to Maurice McNabb, food service administrator, the savings may well run to 15% by the end of the year.

"In the past, we relied on judgment in planning three well-balanced meals a day at an average cost of $8,250. This was always a staggering task, because our dietitians were planning meals for about 10,000 people a day. This included more than 5,000 special meals," he said.

"Now the system enables us to produce comparable meals at a cost of $7,750 a day. It's a simple matter of being able to control our food costs and nutritional requirements more accurately than in the past," McNabb said.

"We got our IBM 360/30 in January of 1969," he said. "After about eight months of data research, putting our recipes in a form that the computer would accept, and coding, we are able to run a 90-day menu."

"When the menu is printed we have to scan the printout, alter the menus with a menu board and color-code the different items on the menu. This has to be done manually, because the computer will select the least expensive of any meal that will furnish the nutrients necessary. For instance, it could select a spaghetti dinner with a macaroni salad," McNabb said.

"We put the corrected menu through the computer and get back an accurate 90-day menu, on a cost-per-day basis," he said.

"As a byproduct of the Computer Assisted Menu Planning (Camp) program, we get a food usage report. This gives a detailed listing of every food item necessary to prepare the menu, so that we can accommodate procurement time," he said.

McNabb said that there had been no change in the 600 basic food items or the 360 recipes used. They are all in the computer memory now, instead of in books and on lists that previously had to be consulted manually, he said.

Also in the computer memory is a price-per-pound breakdown of every item stocked, as well as its nutrient value.

Previously a dietitian needed an average of two days to plan a week's meals at the hospital. Now the dietitian simply enters the food categories desired for each meal. The computer searches through its food lists and menus, measures possible meals against nutrient values and cost constraints and prints out a day's menu in about five minutes, McNabb said.

Hospital officials are seeking other ways of using the computer to save money and operate more efficiently. One such application presently being used involves the storing of information on the patient population. This will enable the hospital to make rapid analysis of patient trends.

Other uses of the computer at the hospital include demographic profiles, inventory control and business systems, McNabb said.

Analysis System, Radar Information Aid Weathermen in Flood Prediction

FORT WORTH, Texas – Weathermen can now sound evacuation alerts in potential flooding areas even before the streams and rivers begin to rise.

Using a data analysis system and radar information on storms, hydrologists at the U.S. Weather Bureau's River Forecast Center in Fort Worth can predict, almost as soon as rain starts, if water will spill over banks and threaten populated areas.

The experimental technique helps reduce the errors and guesswork inherent in conventional methods of flood forecasting and could help save lives and prevent property damage.

In conventional forecasting, the weather bureau relies on sporadic rainfall reports furnished by volunteer observers in low density areas.

"These observers may read their rainfall gauges one or several times a day," said Vic Hoffman, hydrologist-in-charge at the Fort Worth River Center. "Because the reports come from widely separated areas and are sporadic, we have not been able to be precise in our forecasting. Accuracy in forecasting depends upon accuracy in rainfall reports."

With the experimental electronic forecasting program, the Fort Worth station can obtain rainfall information from a radar scope which sweeps over a 30,000 square mile area in Texas and western Louisiana. The amount of rain falling at any time in more than 14,000 points is measured by radar and the information is fed into the system.

The IBM 1130 system then calculates the total volume of rain that will fall, how much rain will run-off, and into which river the water will flow. By comparing the data with mathematical models of rivers, the system can help experts determine potential trouble spots.

During the spring and fall, when flood damage is greatest, the Fort Worth River Forecast Center provides other weather offices with forecasts every six hours. The forecasts cover several hundred points along 10 southwestern rivers which flow into the Gulf of Mexico.

The Fort Worth office, one of 11 regional river forecast centers, soon will begin predicting potential flooding in New Mexico resulting from snow-melt in the mountainous areas.

Scientists Using Computer-Based Study For Identification of Hail-Bearing Storm

CHAMPAIGN, Ill. – Illinois State Water Survey scientists are recording thunderstorm information to analyze storm profiles and compare them with hail statistics for the area.

The study, funded jointly by the National Science Foundation and the state of Illinois, is part of a continuing scientific study of all state water resources and phenomena that affect these resources.

"Last year, hail did about $284 million worth of crop damage throughout the nation," according to S.A. Changnon Jr., acting head of the Atmospheric Sciences Division.

"We are using the computer-based study to see whether we can identify hail-bearing storms as they develop," he continued, "Advance identification is an obvious necessity for any sort of control that would hope to reduce crop and property damage."

To record information about hailstorms in the 1,600-sq mile central Illinois area, the scientists are using an IBM 360/75 in the University of Illinois at Urbana-Champaign.

"Before going to the system, two persons spent a year developing data from a one-hour period of thunderstorms. Now the computer, coupled with a file-scanning device, can process an equivalent amount of data in 200 hours," Changnon said.

To gather radar data on the storms, researchers photograph radar screen activity, and project the processed film later on an illuminated recording board. Operators trace radar echo patterns on the illuminated board, then translate these patterns electronically into numerical values which are recorded on punched cards.

"The computer analyzes time, height of storm echoes, storm duration and intensity, amount of hail, and geographic location," Changnon said.

"Comparing non-hailstorm radar patterns with actual hailstorm patterns gives us clues to the formation and identification of storms. Analyzing the development of thunderstorms producing no hail often provides as much information as analyzing those that do," he said.

Scientist at Illinois State Water Survey studies the thunderstorms occurring over a 29-county area (shown on screen) of central Illinois. Researchers analyze the storm data with a computer for clues to why some storms produce hail.

Telephone Paging System Built Around PDP-8/I

MONTREAL – An electronic telephone paging system, built around a small, general-purpose computer, has been developed and put into service by Bell Canada.

The paging service allows people in London, and Windsor, Ontario, to contact persons within a five-mile radius of the local transmitter provided they are carrying small receivers.

To reach the owner of a receiver, the caller dials the access code plus the seven digit number of the paging unit he wishes to reach. The call is directed to the switching equipment in the telephone company office, where it is processed by the Digital Equipment of Canada, Ltd., PDP-8/I computer.

The computer validates the number, notifies the caller by means of a tone signal that his dialing has been accepted, and converts the incoming pulses to tones for transmission.

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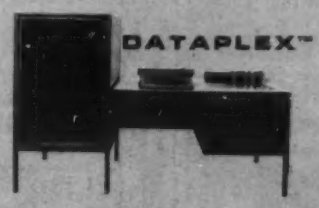


A Growing Trend

Racetrack Minis Save Time, Money in Bet Processing

CHARLES TOWN, W. Va. – As if to demonstrate "once and for all" the wide-sweeping applications of microtechnology, racetracks all over the nation will soon be using computers to save time, money, and, in some cases, nerves.

American Totalisator Co., Inc., a General Instrument company, long known for its ticket equipment and its odds and pay-off tote boards at racetracks, dog races, and jai-alai games, has devised an advanced computer-controlled parimutuel ticket issuing system that minimizes betting time, provides greater flexibility for betting operations, and helps to reduce the burden on racetrack staffs.

The new system, using two Varian 620/i general purpose digital computers, operates at such a speed that it cannot be saturated, or slowed down, by any amount of betting activity, even at the largest of racetracks.

The two or three seconds saved in the processing of a single bet don't seem great to the bettor, but it amounts to a substantial difference when one is trying to serve hundreds of bettors in the last few minutes before post time. However, the man placing his bet at the ticket window would probably not be aware that a solid-state computer was assisting him.

Two Tracks

The prototype equipment is operating currently at the Shenandoah Downs and the Charles Town racetracks here. These tracks operate alternately and maintain an almost continuous year-long racing schedule.

The reliability and flexibility of a stored-program controlled system have also made it possible to introduce a new "three-way" ticket issuing machine.

Regular ticket issuing machines are fixed by mechanical adjustment before racing to produce either a Win, a Place, or a Show ticket. The new machine is able to issue tickets in all three categories under the control of the seller.

This provides the track operation with the flexibility of more easily serving the bettors as the popularity of one category or another varies from race to race. It is not uncommon to have long lines of bettors in front of one or another window, while at the next window there may be little activity in a different category of wagering.

The computer-controlled system compiles betting information, calculates odds, and performs all the other important bookkeeping functions required. It also runs the various public displays on the track infield and other locations.

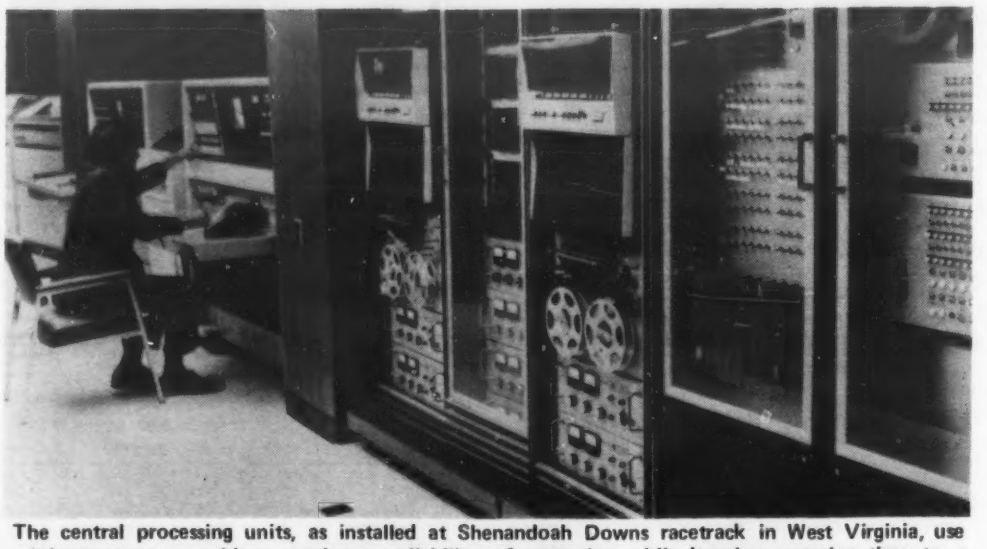
The American Totalisator Co. system assigns two major tasks to the computer. First, it is the executive command and control unit for the functioning of the total ticket issuing system procedure. Approximately 80% of the computer's duties entail this administrative management of the betting.

When the seller at the window operates the TIM to get a ticket, the minicomputers compare the basic bet data for verification. When the receipt of proper data is acknowledged the ticket machine is released to issue the ticket.

Second, the computer does all the arithmetical computations connected with each individual bet. For example, with each bet the odds, the payoff price, and other data are affected. The machines must check each bet, make sure everything is in order and that all figures are correct, and then adjust its own memory accordingly.

This function takes about 20% of the minicomputer's time. Track management gets hard-copy printouts summarizing all actions. Accuracy is critical as strict legal regulations require complete recordkeeping.

This first system in West Virginia is the prototype of a series of similar equipment which the company plans to install around the rest of the country.



The central processing units, as installed at Shenandoah Downs racetrack in West Virginia, use minicomputers to achieve maximum reliability of operation while keeping wagering time to a minimum.

Computer Design Takes Unconventional Approach

CULVER CITY, Calif. – Computers are being used to design other computers at Hughes Aircraft Co.

Actually, the computers take information from design engineers, refine it, check it for accuracy, add the necessary details, and format it for an automatic drafting machine where design blueprints are made. From these prints come the complex circuitry that comprises the heart of a computer.

"The same task done manually would require many men working many hours," according to Harry M. Taxin, of the Data Systems Division. "We used the automatic system 20 hours a day during the week and 24 hours a day on weekends."

Taxin said the design system is made up of a large General Electric computer, a medium-scale Digital Equipment Corp. PDP-9 computer, and a Gerber automatic plotter.

The primary use of the automatic system is in the design of advanced electronic circuitry, including large-scale integration (LSI), for computers for the guidance systems of aircraft, missiles, and spacecraft.

Used in the Surveyor spacecraft and General Dynamics' F-111 aircraft projects, the system has also aided in the design of antennae and nose cones for missiles.

The GE computer provides storage for the various mathematical formulas used in the design work and information on size of circuit boards, types of wiring, number of connector pins, and overall packaging. Programs that merge the physical information with that supplied by the designers are also included.

When this is completed, the data moves to the PDP-9, where it is verified and prepared for the plotter. Once in the plotter, blueprints are prepared. A blueprint for a typical LSI circuit might take two hours to produce. "The plotter is not fast but is very accurate and flexible," Taxin said. "We could not hire the people to do as good a job."

Six terminals are linked to the PDP-9 including an Adage television-like graphics terminal. Currently this terminal is used in research, but Taxin predicts that eventually designers will use it and terminals like it in their work. "Complex circuits will be designed right at the computer," he said, "eliminating a lot of time-consuming paper work."

Data retrieval with no base editing or restructuring.

The Computer Audit Retrieval System (CARS) is written in COBAL and can retrieve data stored on third generation systems with a minimum configuration of a 360/30 (with 32K bytes of storage). No other system on the market today can match its combination of low cost and high power.

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CARS has been fully tested on IBM DOS-TOS, as well as OS, and will run (with a COBOL compiler) on most third generation equipment.

The system is currently operational, either at the console or through a terminal.

Call or write for complete information.

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Casars costs $15,000. The system may be leased.

Computer Applied Systems Inc. is located at 18075 Ventura Blvd.

The Above Article Originally Appeared in Computerworld February 25, 1970.

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When Is a Pound Real Sterling?

British Note Printers Try Dallas Brand of Checking

By Thomas J. Morton
CW Midwest Bureau

DALLAS – This time it was Texas where "the Redcoats were coming," and they came to watch American ingenuity and American equipment solve a problem for them. The "Redcoats" were Geoff Buckle and Harold Thorn, Bank of England officials, and their problem was finding a better method for the disposal of incorrectly printed Bank of England pound sterling notes.

Now, Bank of England pound sterling notes are inspected manually. The notes come off the presses in sheets of 500, and, literally, hundreds of people are employed to inspect these sheets visually for flaws. When a flaw is noticed, the inspector makes a record of the six-digit number of the bill, and then later, after the sheets are cut into individual notes and stacked, he has to go through the stacks to find his flawed note.

Bob E. Killian, public relation manager of Recognition Equipment Co., in Dallas, explained why the British came to Dallas. "Our UK subsidiary, Recognition Equipment, Ltd., learned of this time consuming and expensive operation and offered, as a solution, our computer-controlled sorting equipment." And the British came to Dallas to test out the idea.

Recognition Equipment suggested to the Bank of England that, as 500 note sheets came off the presses and an inspector detected a flaw, all the inspector had to do was make a mark on the flawed note with fluorescent ink – an ink that is invisible to the human eye – and send the sheet on to the cutter. The inspector's work would be finished. A computer and a reader/sorter would finish the job.

The test was conducted in Dallas, with Recognition Equipment receiving $120,000 worth of pound sterling notes, complete with armored car, armed guards, and tight security. The stacks of notes were then run through Recognition Equipment's standard bar code reader/sorter which was controlled by a Data Craft DC6024 computer.

"The computer had two jobs," Killian told CW. "It was preprogrammed to control the reader part of our equipment as to what to read, and to control the sorter portion as to what to do with the documents the reader had just read."

When the reader "saw" the fluorescent mark of a flawed note, it told the computer of its find, which told the sorter to dump it into the "bad note hopper." When the computer was told of a good note, it instructed the sorter to stack them neatly into piles of 100, all at a speed of 2,400/min.

Normally, a flaw in printing is more annoying than serious, but in the printing of money, a flaw is an out and out headache. Flawed currency, like flawed stamps, becomes very valuable collectors' items and eventually nothing but trouble for the government printers.

A Chicago rare coins dealer told CW of a U.S. $1 bill that has a double image of George Washington. That particular bill, or one of its kind – and the dealer wasn't sure of the exact number of them in existence – is worth well over $100.

Killian stressed the fact that the test was just a demonstration, and did not imply that the Bank of England had ordered a computer-controlled sorting system.

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Ask your man from Memorex about Uni-Spray, or write for our free Uni-Spray brochure: Memorex, Santa Clara, California 95050.

MEMOREX

Interface Allows Mini to Operate as 2803 Tape Unit

By Frank Piasta
CW Staff Writer

SCOTTSDALE, Ariz. – An interface that makes a minicomputer operate like an IBM 2803 tape control and tape unit for a System 360 computer has been developed by Datawest Corp.

Called the 531 Series Interface Unit, the interface was designed for the Data General Nova and Supernova minis. Models that can accommodate the General Automation SPC 16 and Honeywell 316 are also available; one for the Lockheed MAC-16 is being developed.

The first user of the 531 is a firm that is developing an on-line data entry and credit authorization system for a major bank. The 531s will be used to interface two Supernovas with a 360/50. Each Supernova will, in turn, have 20 CRT terminals on-line.

360 Software Simplified

A spokesman for the user stated that the interfaces were being used to simplify the software required for the 360. Since the terminals would be under the control of the Supernovas, IBM, Btam or Tcam communications systems would not be required resulting in a reduction of software overhead on the 360. As an example, only tape read and write commands are required for the 360 to communicate with the minicomputers, when the 531 is used.

Hardware requirements for the 360 are also reduced. Tcam, for example, requires at least 128K of main-storage and space on one or more 2311 or 2314 disk units for intermediate storage of message queues, the spokesman said.

In addition to terminal control, the Supernovas will be used for data validation, batching and totaling, with the 360/50 being used primarily for file maintenance.

The 531 interface to the 360 is an exact plug-to-plug replacement for the 2803 and requires no special 360 programming, Datawest said. It is byte-oriented and contains a similar address decode, status register, and sense register.

The meaning of the individual bits in the interface and in the minicomputer is mostly determined in the minicomputer programming, the company said. The interface to the mini is 16 bits wide for "reading" and "writing" data. All information is conveyed to and from the mini by direct memory access.

Interface: Burst Mode

The interface always operates in the burst mode with respect to the 360; it can be connected to the computer either through the selector or the multiplexer channel. The address and device code assigned to the interface is normally specified at time of order by the user.

A write command issued by the 360 results in the storing of data in ascending core locations in the minicomputer, starting at the address supplied by the mini.

A Read or a Read Backward command results in the passing of data from the mini to the channel with data being read from ascending core locations beginning with the starting address supplied by the mini. The operation is controlled by a word count supplied by the 360 program.

A spokesman for Datawest told CW that a version of the 531 series is currently under development for attaching a minicomputer to a Univac 1108 system. The object of this device would be to have the mini emulate a fixed-head disk drive. This interface will be announced in the early part of September, the spokesman said.

The 531 Series Interface Unit is priced at approximately $6,000. First customer deliveries are scheduled for June 30. A delivery schedule of 60 days is currently being quoted by the company.

Datawest Corp. is at 7503 E. Osborn Road.

Data Entry, CRT Terminal Forms Part of T/S System

LEXINGTON, Mass. – A data entry and verification system from Entrex Inc. incorporates the features of a CRT terminal in a keyboard-to-disk-tape system that is configured like a "mini-time sharing" system.

Said by the company to be "operator proof," the Entrex 480 features a Help key that is used by the operator to request instructions for any operation.

The Entrex 480 comprises a dedicated computer and disk unit, controlling up to 64 individual Data/Scope keystations; output is on magnetic tape. The Data/Scope station features a 480-character display, claimed by Entrex to be the largest in the industry.

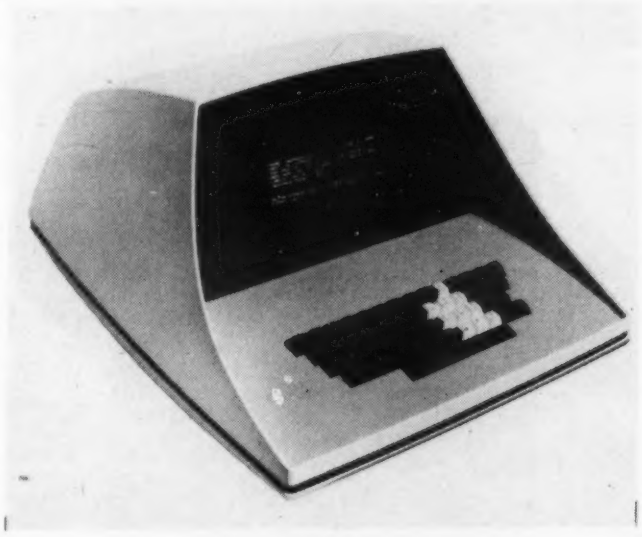
Either keypunch- or typewriter-format keyboards are available. A 10-key numeric module is available as an option with the typewriter keyboard. The keyboards have a built-in soft clicking sound as each key is depressed, which the manufacturer said helps to maintain keying cadence.

Help Button

Should the operator forget the procedures, she presses the Help button. Simple instructions are then presented to her in a multiple choice format on the screen, telling her what to do.

Data entry is usually performed using the "fill in the blanks" method familiar to CRT terminal users. The fixed data giving the field names may or may not be recorded along with the variable data at the user's option, the company said.

Entering mistakes is difficult, according to Entrex. Each field entered is checked for validity. Check digit verification, format checks, batch totals, upper and lower limits and zero balance checks may be performed on each field as it is entered. Entrex said there is a similarity between the operator comparing data on her screen with a secretary proofreading a letter after typing it.



Entrex 480

In addition to the verification performed by the operator on an informal basis, there is a second form of visual verification where the operator indicates with a keystroke that a given field has been proofread. The cursor then advances to the next field to be checked.

Key Verification

Key verification is performed by essentially duplicating the original input process, with the character keyed by the verifying operator displayed on the CRT. In case of an error, the cursor is held at the error position until the correction is made, and an error message appears at the bottom of the screen.

One station is used by the supervisor who can enter, delete, or permanently modify programs in the library. Individual operators can call programs from the library, stored on the disk file, and make temporary changes to them.

In addition to the standard batch totaling of one field, an option is available that would allow up to 15 additional totals to be taken, Entrex said. Also available as an option is the ability to make intrarecord calculations automatically. For example, a field from record A could be added to a field in record B, with the resultant total stored in record C. Subtraction, multiplication and division could also be performed.

Data is entered under control of the processor, a 16K Data General Nova which has access to the disk drive for program storage. An unlimited number of format programs can be stored, according to Entrex. The required software will be supplied and maintained by Entrex, the company said.

The disk unit, available in capacities of 11, 22, or 44 megabits, is used for intermediate storage. The files are held there while being verified and assembled.

Data Files Reformatted

In addition to checking input for validity, the Nova will reformat data files as they are passed from disk to tape. With editing, blocking, and labelling being performed at this time, Entrex said that the data is 100% accurate and ready for computer input.

The final storage device is a tape drive that can be either 7- or 9-track, IBM-compatible in design. Tape density of the 7-track unit is 556 bit/in., with 800 bit/in. available as an option. The 9-track drives use 800 bit/in. density with 1,600 bit/in. available as an option.

At present, the supervisor must manually request the data to go from the disk to the tape, but an optional feature will be announced soon, Entrex said, that will automate this procedure.

Designed for the medium to large installation, an Entrex spokesman said that his company's system becomes price competitive with other key-to-tape systems with installations of 10 or more terminals. Rental for a typical Entrex 480, consisting of 16 Data/Scope keystations, a 16K processor, disk and tape drive, is $2,250/mo. Purchase price is approximately $90,000 to $100,000, depending on options.

First customer deliveries are scheduled for mid-August, with a 120- to 150-day schedule for deliveries after that.

Entrex, Inc. is at 113 Hartwell Ave.

Raytheon, IBM Units Get 'Discontroller'

SANTA ANA, Calif. – Electronic Engineering Co.'s Discontroller is now available for use with Raytheon 706 computers and either IBM 2311 or 2314 disk drives.

The EECO Discontroller is one of a series of models which can be used to provide minis and midicomputers with quick access, large capacity memories, the company said.

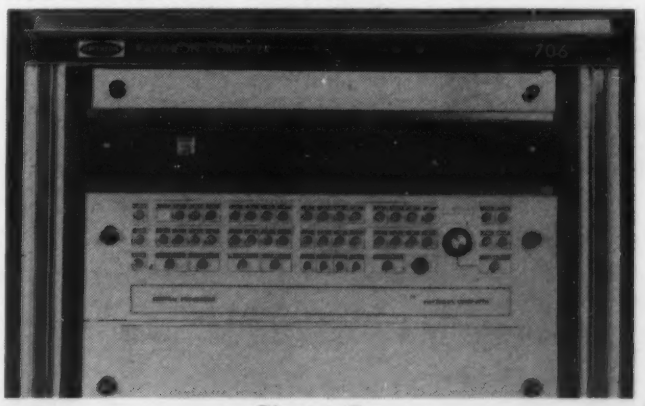
The Discontroller is connected to the computer I/O bus and includes all the necessary logic, control, and driver circuits to interface with any IBM compatible 2311 or 2314 type disk drives, EECO said.

The model for the Raytheon 706 computer uses standard EECO data format which records 340, 8-bit bytes on each disk sector as compared to 215, 8-bit bytes for the IBM format. This is an increase in data storage capacity, for each disk pack, of 58%, the company said.

Discontrollers with other formats, including the IBM format, are available now.

Prices start at $5,000. Normal delivery is 60 days.

EECO is at 1601 East Chestnut Ave.



Discontroller

AJ 841 Terminal Designed as Replacement for 2741

SUNNYVALE, Calif. – Described by the manufacturer, Anderson Jacobson, as being a fourth generation on-line conversational terminal, the Selectric-equipped AJ 841 is designed to replace the IBM 2741 communication terminal.

AJ 841 Terminal

Equipped with a built-in modem, or with an EIA interface, the AJ 841 can be used with Bell DAA devices or with acoustic couplers. The Local/Com switch converts the unit to off-line for use as a typewriter.

According to the company, the terminal was designed with great attention to 2741 detail. Cited as an example of this thinking is the inclusion of the 2741 keyboard rollover feature. This is a mechanical device that allows two keys to be struck simultaneously without jamming the machine. The key with slightly more pressure applied to it will print first. This is said to enable fast typists to maintain their speed more easily.

Also of benefit to the fast typist is a two-character buffer that allows one-second bursts at rates up to 17 char/sec. According to Anderson Jacobson, other Selectric terminals print errors with burst typing speeds that exceed 15 char/sec.

The heavy duty Selectric mechanism in the terminal, the company said, is more reliable because of the replacement of high-wear mechanical parts with AJ-designed parts. MSI solid state integrated circuits on pluggable printed circuit boards are accessible at the rear of the terminal for maintenance.

An option of the terminal is the inclusion of the Reverse Break device. The opposite of an Attention key, it enables the computer to interrupt keyboard input by locking the keyboard. The computer can then transmit to the operator at the terminal.

Other optional features include Typamatic repeating key feature, a portable carrying case, and a choice of several pin feed platens. Modems designed for use with private, leased, and shared lines will soon be available, according to the company.

The AJ 841 has been priced at $4,100 with an EIA interface; at $4,475 with a 300-baud modem, connection for DAA, and an attachment for an external acoustic adapter; and at $4,574 with a 300-baud modem and acoustic coupler.

Customer deliveries are scheduled to begin in August or September. Shipments at that time will be made from stock, the company said.

Anderson Jacobson is at 1065 Morse Ave.

Matrix Printers Called 'Silent'

CUPERTINO, Calif. – Versatec has a line of six different hard-copy output peripherals which were developed with a nonimpact, silent (electrostatic) printing technique.

Called the Matrix Series, the products are designed for use with minicomputers, midicomputers, and CRT terminals for the applications where hard copy records are required. According to Versatec, interfaces are available for most popular computers and CRT terminals, and software packages for graphics applications.

The Matrix 300 and the Matrix 600 are 300 line/min (400 char/sec) and 600 line/min (800 char/sec) printers, respectively. Alphanumeric data is accepted in serial or parallel codes which include Ascii. Input is applied synchronously or asynchronously, and is printed as 5-by-7-dot matrix characters in 80 columns on 8-1/2 in. wide paper. The Matrix 300 costs $5,500; the Matrix 600 costs $6,700.

The products are scheduled for June availability.

The Matrix 100 and Matrix 200, graphic output devices, offer 7-3/4 in. of plotting area on 8-1/2 in. wide paper for alphanumeric and graphical printout from software generated data.

Input for the 100 and 200 consists of seventy 8-bit byte/scan, which can be accepted in either serial or parallel form. Incremental drive systems reportedly permit synchronous or asynchronous paper speeds up to 120 and 240 step/sec, two step/scan. The Matrix 100 costs $5,900 and the 200 costs $6,500.

The Matrix 100A, a combination printer/plotter, has the characteristics and capabilities of the Matrix 300 and Matrix 100. Ascii and other input codes are decoded to character by means of a solid-state Read-Only-Memory (ROM). A second input permits simultaneous graphical printing from software generated data. The Matrix 100A is priced at $7,300.

The Matrix 200A, a combination of Matrix 600 and Matrix 200, sells at $7,900.

In addition, Versatec has developed a system for printing and distributing computer and/or communications hard-copy output. Called the Multiplus, the system consists of one master Matrix printer and a number of less expensive slave (repeater) printers that are controlled by the master unit or by software from a computer.

An original hard copy is produced by the master printer, and repeated original copies can be produced simultaneously at any or all of the slave printers, the company said.

The slave printers can be located at long distances from the master unit. The Multiplus System operates at speeds of 30 to 60 times those of conventional systems in use today, the company said.

Total Multiplus system prices depend on the number of printers in the system, distances from master to slave printers, speed of operation, and the type of data being processed.

Versatec is at 1010 Bubb Road.

SCORE™

ANCHOR HOCKING
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Lancaster, Ohio 43130
February 9, 1970

Mr. Robert P. Wolk
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	RPG	COBOL	SCORE
Programming	11.8	22.8	4.0
Keypunching	4.1	7.3	.5
Computer Time	1.9	1.7	1.0
TOTAL HOURS	17.8	31.8	5.5

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Programming Methods Inc.
51 Madison Ave., New York N. Y. 10010
Edward Opengart, V.P., 212 889 4200

All other areas contact
Atlantic Software Inc.
Lafayette Bldg., 5th & Chestnut Sts.
Philadelphia, Pa. 19106
Robert P. Wolk, V.P., 215 925 8424

Peripherals for Minis Have Controllers, Interfaces

ORLANDO, Fla. – Low-cost peripheral devices with controllers and interfaces from EDP Technology, Inc. can be used with several minicomputers.

Developed for the Nova and Supernova, the devices can be adapted to the PDP-8, the BIT-483, and the MAC-16 minis, according to Dick Eynon, the company's chief engineer.

The peripherals include a 2311-compatible disk system, a 300 card/min reader, two 30-char/sec keyboard/printers, and a multi-cassette tape unit. Also available is a controller that adapts a cartridge tape system to the minis.

Disk System

The disk system consists of a Bryant Model 1100 drive, an EDP Technology interface/controller, and a software driver package. The disk drive has a capacity of 7.25-million bytes and an average seek time of 75 msec. The disk speed is 2,400 rpm and the data transfer rate is 159K byte/sec. An IBM 1316 or equivalent pack is used.

The controller is program-controlled for head-track selection and employs the mini's data channel for read and write operations. It is compatible with all 2311 type disk drives and can be purchased independently, according to the company.

The price of the disk system is $22,500. First shipments are scheduled for Aug. 1, on a 45- to 60-day schedule.

Card Reader

The card reader, built by General Design Inc., comes equipped with an interface/controller and software. The reader has operator controls and indicators, and employs a vacuum card pick and feed mechanism. The hopper capacity is 600 cards and the unit is designed for desktop mounting.

The interface/controller is under program control. It is packaged within the card reader enclosure and connected to the mini through the standard I/O bus, the company said.

The price of the unit including the controller is $3,250, and is currently available on a 30- to 45-day schedule.

Keyboard Printers

One of the keyboard/printers is compatible with software written for the Teletype Model ASR-33 and uses the same device codes and interrupt mask bit. A full, 64-character, Ascii set is provided; other codes are available.

The printing unit, made by Univac, features printing, spacing, and line feed at 30 char/sec. Form feed and automatic skip perforation can be enabled and disabled under program control. Status data available to the computer includes skip perforation in progress, out of paper, and fuse blown.

Priced at $5,500, including interface, the unit will be available for customer shipment on July 1 on a 45- to 60-day schedule, the company said.

The other keyboard/printer consists of a Litton Model 30 printer and a Model 10 keyboard, in addition to the interface/controller. It has a 10 to 100 char/sec space or tabulate speed, and can handle both perforated and non-perforated forms.

The printer features direct tab forward/backward, 192 char/line, split platen, pin or friction feed, adjustable width up to 17 in., and red or black print under program control.

The keyboard is a photoelectric unit and has 74 keys including a ten-key adding machine configuration. A one-character buffer is included.

The device will be available on July 1 at a price of $6,250. A 45- to 60-day delivery schedule is being quoted.

Cassette Tape Drives

From one to three International Computer Products' cassette tape drives can be configured into a system that includes a serial interface and software.

The tape units use standard Norelco-type cassettes with computer grade tape. The data rate is 300 16-bit word/sec as a result of a tape speed of 10 in./sec. The recording technique used is bit-serial, two-track redundant with parity per 16-bit word. Fast forward and fast rewind are provided.

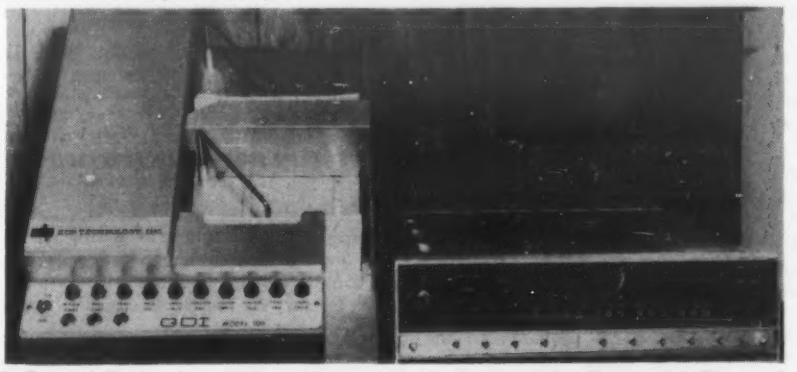
The software driver performs functions required for read, write, parity generation and checking, rewind, and end-of-file mark generation and recognition.

Single cassette units are priced at $2,000. A dual cassette drive sells for $3,000. The triple cassette carries a price tag of $3,800 and are currently available on a 30- to 45-day delivery schedule.

Also offered is a controller, Model C/N-10, for the Tri-Data Cartrifile Model 4096. The Cartrifile has a two-cartridge capability and each cartridge contains two independent tape drives. Up to 240K. 8-bit characters can be stored on each tape. Tape speed is 10 in./sec and the transfer rate is 667, 8-bit char/sec.

The price of the controller is $1,800 and it is currently available on a 30- to 45-day delivery schedule.

EDP Technology is at 811 N. Magnolia Ave.



A General Design Inc. 300 card/min reader is shown with a Nova mini. The card reader, equipped with an interface/controller, comes from EDP Technology Inc.

CalComp presents a brilliant new film producer.

Up until now, you could buy your computer either a brilliant and versatile microfilm plotter.

Or a brilliant and high speed microfilm printer.

But you couldn't buy, for any reasonable amount of money, one film output system that was both.

Now you can.

CalComp presents the 1670 COM system. It's a plotter.

CalComp's new offline 1670 COM system is the finest Computer Output Microfilm plotter you can buy.

It draws at a rate of 500,000 increments a second.

Features a programmable raster of 16,384 by 16,384 positions. The finest resolution available.

And cuts tape write time to a tenth or better over previous microfilm systems.

With twenty usable line widths, the 1670 COM system is ready to draw practically anything.

And with the support of CalComp's extensive library of basic, functional and application software, it practically can.

CalComp presents the 1670 COM system. It's a printer.

If your primary need is for a high speed printer, the CalComp 1670 COM system is that, too.

System throughput, using hardware character generation, is 7,000 to 12,000 lines per minute.

And with CalComp software you can put it in any type font, size, or language you like.

With an optional forms projector, you have 16 program selectable forms.

And take your choice of cameras. 16 or 35mm. Sprocketed or unsprocketed. Even a 105mm microfiche option.

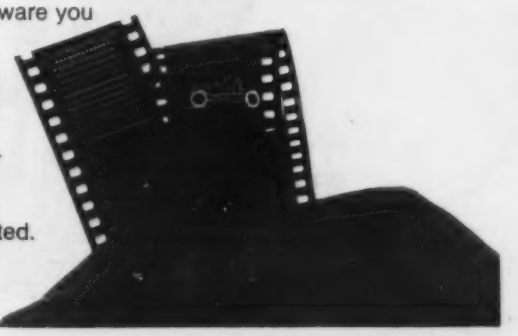
So if you haven't been able to decide between a microfilm system that *plots* or one that *prints,* call your nearest CalComp man today. (CalComp has offices in 34 cities.)

And tell him you want to discuss the brilliant new producer that does both.

CALCOMP

TEACH YOUR COMPUTER TO DRAW.

California Computer Products, Inc., Dept. W-6
2411 West La Palma Ave., Anaheim, California 92801



Adapso to FCC: Bar Carriers Offering DP Service

By Don Leavitt
CW Staff Writer

NEW YORK – The Association of Data Processing Service Organizations (Adapso), has told the FCC that communication common carriers, and their affiliates, should be barred completely from providing DP services. Barring such a foreclosure, Adapso said the FCC should establish a new office to police the carriers adequately.

At the same time, Adapso said that the commission should not regulate non-common carriers in the offering of hybrid, data processing, store and forward switching services.

These proposals were contained in a series of "suggested improvements" filed by the Computer Timesharing Services section of Adapso, in response to the FCC's preliminary ruling that would prohibit communications common carriers from offering data processing services, unless they established wholly separate subsidiaries. When the FCC issued its tentative decision in early April, the agency invited comments from interested parties before the ruling was formalized.

Services Restriction

The tentative decision indicated that the carriers could offer DP services under

Communications

certain restrictions. Chief among these was the requirement that the carriers set up completely independent corporate entities to carry on the DP services.

After reviewing the restrictions, Adapso recognized the possibility that unfair competition could still exist, because of the difficulty of policing the carrier-DP service relationship. Without such policing, Adapso said, the carrier could in fact support the DP operation with funds from the established carrier's operations.

If such shifting of funds took place, it could cause deterioration of the carrier's basic communications service, or an increase in rates charged to the users, an Adapso spokesman said. Unfair competition would also result, according to the service organization.

Common Carrier Office?

If the commission does not completely block DP services being offered by the carriers or affiliates, Adapso said it should set up an Office of Common Carrier Service under the Common Carrier Bureau. Such an office should be technical in emphasis so that it could review complaints by users on the quality and adequacy of service.

An Adapso spokesman said that the proposed office should have field investigators who could initiate actions in addition to reacting to complaints. The new office should also have the power to bring court actions to stop illegal carrier practices, according to Adapso.

Imposition of fines, usually insignificant in amount, would be "nothing more than a slap on the wrist and a 'you're a bad boy'" to most carriers, Adapso said, but the threat of an antitrust suit or other action would make the offenders "think twice" about continuing an activity in violation of FCC rules.

Speaking of the FCC in general, the Adapso spokesman said that the agency is doing an intelligent job in the areas it is already supervising. It would, however, be "swarmed under" with additional administrative detail if it allows the tentative decision to become FCC policy without creating the new office to police the DP services subsidiaries of the common carriers.

A dirty tape can give a computer the DT's.

Dirty tape causes data dropouts. And dropouts can make a computer see things that aren't there. That costs you money. And that's enough to make anyone see red.

RCA Computer Tape helps computers read and write right.

It's a special formulation that starts cleaner. Every inch of every reel is tested and certified in the cleanest of white-room conditions. (We think statistical testing leaves too many blind spots.) And it stays cleaner, longer.

So? Fewer dropouts, more efficient computing.

Help your computer see things as they really are. Write RCA Magnetic Products, 201 E. 50th St., New York 10022.

Our tape keeps the DT's away.

RCA Computer Tape

Hardware Independent Communications Net For U.S., Canada

PALO ALTO, Calif. — A U.S. and Canadian telecommunications network, designed to be hardware independent, is in operation over Bell System lines through 14 district offices of Tymshare Inc.

The time-sharing and data transmission system, called Tymnet, will be fully operational by the beginning of 1971. The Tymnet system will tie satellite processors – called Tymsat Phase IIs – situated in district offices in the U.S. and Canada to Tymshare centralized computer facilities (XDS 940 systems) over a network of dedicated Bell lines.

The Tymsat Phase II processors are Varian 620/i programmable computers which are tailored to Tymshare specifications and software.

With the system, Tymshare subscribers in a district office area can, through a local phone call, obtain instant access to the national computer center in Cupertino, Calif., or to auxiliary centers in the Los Angeles, Boston, New York, and Washington, D.C. areas.

There is no surcharge or other additional cost associated with Tymnet for Tymshare clients, the company stated. A user only pays local phone costs when he accesses a long-distance center.

Diagonal Parity Check

The Tymnet software includes diagonal parity check for error detection and correction procedures which reportedly almost eliminate the possibility of flawed data being transmitted or received.

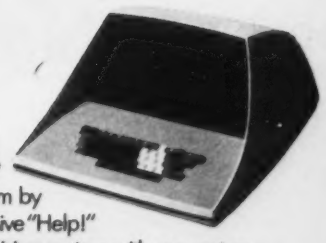
The software also provides the ability to accommodate a multiplicity of user terminals of varying transmission speeds. Programming that makes all the terminals appear like Teletype Model 33s accomplishes this. A Tymsat Phase II processor can handle 32 Teletype Model 33s, and has space for 8K words of core memory.

The software also gives a capability for automatic rerouting of message transmissions through a ring configuration of Tymsats in case of a break in the dedicated private line facilities. Assurance of processing power is always available through multisystem linkages and common file accessibility at Cupertino, the company stated.

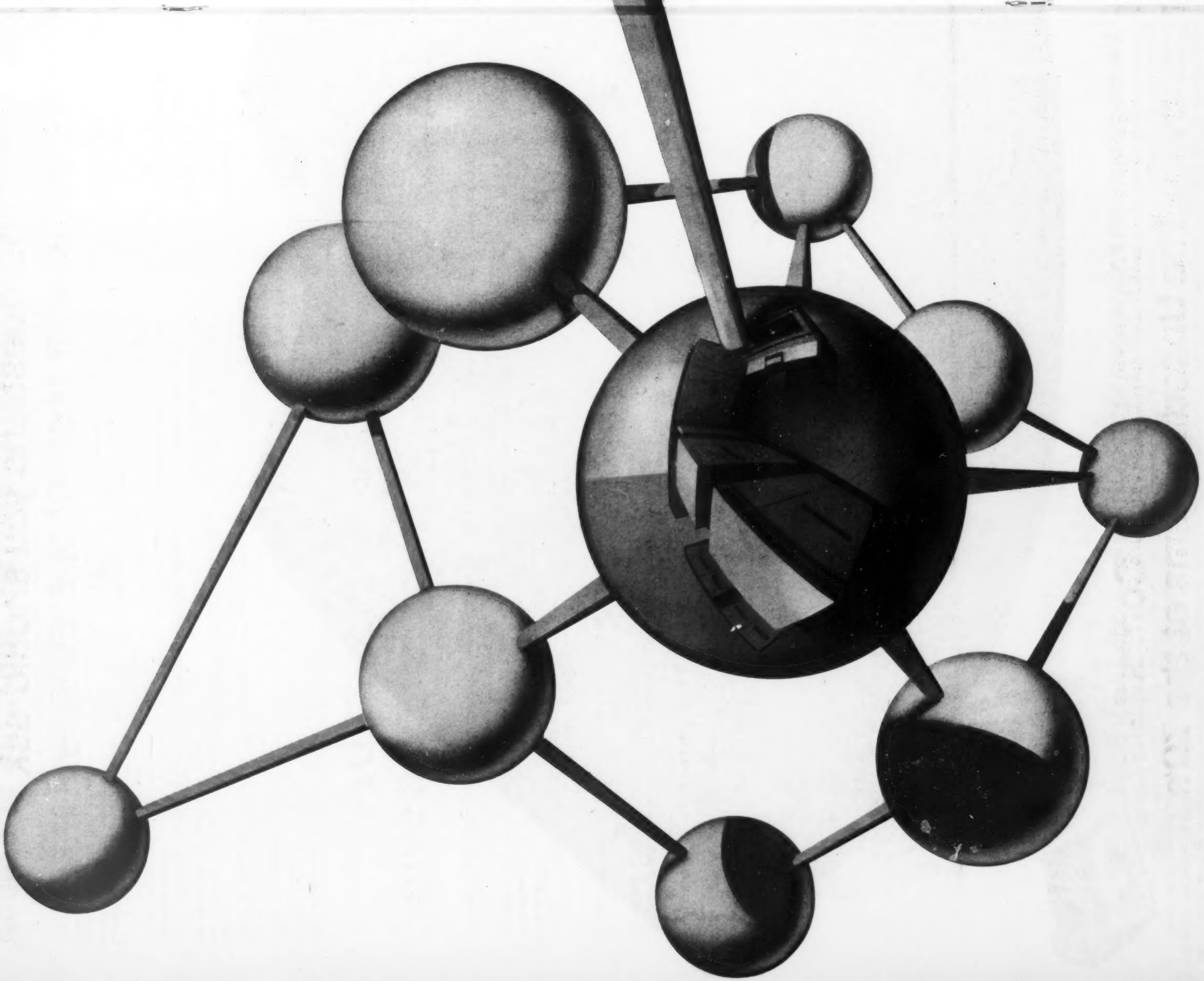
Tymshare has an XDS 940 in operation in Paris, but communications media across the Atlantic are not yet existent. A spokesman said that it would be "conceivable to have French computers during idle hours being used in another continent with different busy hours."

Tymshare, Inc. is at 525 University Ave., Suite 220.

We taught our data entry system to speak a new language: Dumb Blond.



Now there are two trains of thought about data entry. One of them is that you should teach girls to talk to a computer in the computer's language. It's called key-punch. Or key-to-tape, or key-something. The other is to teach the computer to talk the girls' language. It's called simple. We caught the second train. We invented the ENTREX™ 480 data entry system. It's the fastest system going: built around its own computer and disk, it controls up to 64 individual DATA/SCOPE™ CRT key-stations. To us, it's a CRT-to-disk data entry validate/verify system, with magnetic tape output. To her, it's a typewriter and a nifty little tv screen: She can be the dumbest blond you can find. It's so easy to use, a girl can be trained to operate it in a couple of hours. If a girl can type, she can enter data on our system. If she can read, she can verify it on the DATA/SCOPE™ 480-character display. And she can get out of any jam by merely pushing the exclusive "Help!" button. We knew you could save time with our system. What we wanted to do is save you money, too. But you'll probably only believe that when you see it. So, see it. Write or call ENTREX, Inc., 113 Hartwell Ave., Lexington, Ma. 02173, (617) 862-7230. **ENTREX**

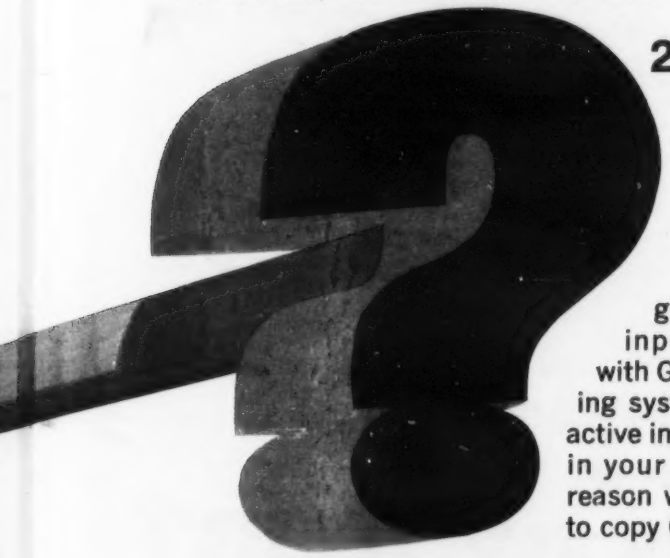


10 questions you should ask about your present operating system ...and about GECOS III

These questions are vital to any user of multiple computer systems . . . anyone struggling to solve the problems of incompatible programs and files . . . any business manager trying to link all his batch, remote access and time-sharing into one common system run from one common data base.

GECOS III* — operating system for General Electric's GE-600 Line of large-scale computers — was first, by years, to meet these problems. And we believe the answers to these ten questions will show you it's still ahead by years.

1. Are you running third generation hardware with a second generation operating system?
"Third generation" means more than just hardware. Operation of a third generation system also demands the capabilities of an operating system like GECOS III — multiprogramming, multiprocessing, three-dimensional concurrent access, and a common data base.



2. Do your $20,000-a-year computer users waste time carrying work to the computer . . . or waiting for results?
They can write and maintain their programs direct from an input/output terminal with GECOS III. One operating system gives them a reactive interface to all software in your system. That's one reason why others are trying to copy GECOS III.

3. Are you adapting your business to your computer? Or your computer to your business?
GECOS III evolved to meet *user* needs. First, it keeps tabs on what your workload is through video system monitoring (VISTA), hard copy monitoring (System Resource Monitor), detailed accounting reports and system simulation. Then, it multiprograms your batch, remote access and time-sharing jobs simultaneously . . . and provides service on demand when you need it.

4. How long does it take to reconfigure your system? All day? Hours? Minutes?
GECOS III adapts itself to any standard configuration. It's truly automatic — the one operating system that matches third-generation software with third-generation hardware.

5. When one module fails, does your system go down?
Not a United System with GECOS III. An on-line test and diagnostic system monitors the central computer's peripherals and communications processors while the system keeps running. Troublesome system modules can be isolated before failure occurs. GE field engineers can then make repairs while the rest of the system runs normally.

6. How many separate file systems do you need to support your business?
Only one central integrated file system with GECOS III. The data base is conveniently accessed by batch, remote batch, or time-sharing programs. You get the flexibility you need to build your own management information system.

7. Can your FORTRAN and COBOL programs talk directly to any remote terminal on the system?
They can with GECOS III's unique remote access capability. Messages are never delayed in centralized message queues. Each message is placed under the complete control of the application system designed to service it.

8. How much does your business pay for time-sharing over and above your normal computer expenses?
GECOS III lets you assign whatever resources you need to support a variable time-sharing load, and to alter those resources dynamically throughout the day. Your users get access to a wide range of time-sharing capabilities . . . plus terminal access to all batch software.

9. Is your system's performance limited by your operators' abilities? Or is the system self-optimizing?
A United System with GECOS III optimizes its own operation by managing system resources and automatically scheduling your work. Your operators get their direction from the system, thus they can help make your operation truly productive.

10. Do you use multiple systems to serve multiple applications?
As a typical example, GECOS III can do all five below simultaneously:

- remote inquiry
- on-line data processing
- batch data processing
- engineering analysis
- text editing

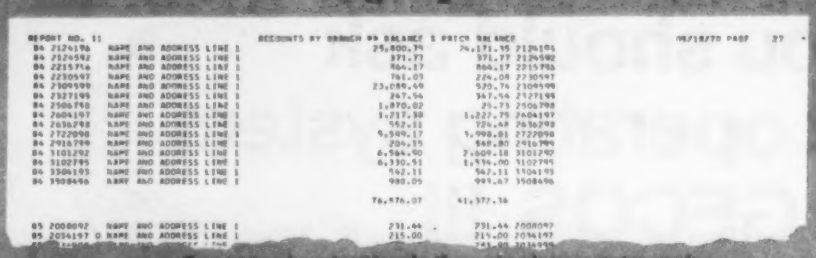
GECOS III is just one of many reasons why a GE United System can help you unite your computers, your people, and your business now. For more information, call your nearest General Electric Information Systems Sales Representative. Or write to General Electric Company, 1 River Road, Schenectady, New York 12305. 290-74

*GECOS: Trademark of General Electric Co.

GENERAL ELECTRIC

General Electric Computers: The United Systems of the 70's

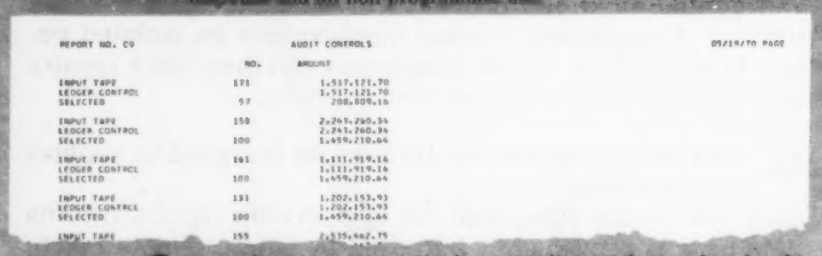
All the following reports and files were produced in one pass of the master file.



REPORT NO. 11 — ACCOUNTS BY BRANCH 99 BALANCE $ PRIOR BALANCE — 05/18/70 PAGE 27

86 2126196	NAME AND ADDRESS LINE 1	25,800.34	24,171.35	2126196
86 2126502	NAME AND ADDRESS LINE 1	371.77	371.77	2126502
86 2215716	NAME AND ADDRESS LINE 1	864.17	864.17	2215716
86 2230597	NAME AND ADDRESS LINE 1	741.03	224.08	2230597
86 2309599	NAME AND ADDRESS LINE 1	23,089.49	520.76	2309599
86 2327196	NAME AND ADDRESS LINE 1	347.94	347.94	2327196
86 2506798	NAME AND ADDRESS LINE 1	1,870.02	25.73	2506798
86 2604197	NAME AND ADDRESS LINE 1	1,217.38	1,227.75	2604197
86 2636298	NAME AND ADDRESS LINE 1	552.11	724.49	2636298
86 2722998	NAME AND ADDRESS LINE 1	9,584.17	9,998.81	2722998
86 2916799	NAME AND ADDRESS LINE 1	284.15	868.80	2916799
86 3101297	NAME AND ADDRESS LINE 1	8,584.90	7,689.18	3101297
86 3102795	NAME AND ADDRESS LINE 1	6,390.51	1,914.00	3102795
86 3304193	NAME AND ADDRESS LINE 1	562.11	562.11	3304193
86 3508496	NAME AND ADDRESS LINE 1	980.09	994.67	3508496
		76,976.07	41,372.36	
85 2008092	NAME AND ADDRESS LINE 1	231.64	231.64	2008092
85 2054197 D	NAME AND ADDRESS LINE 1	215.00	214.00	2054197

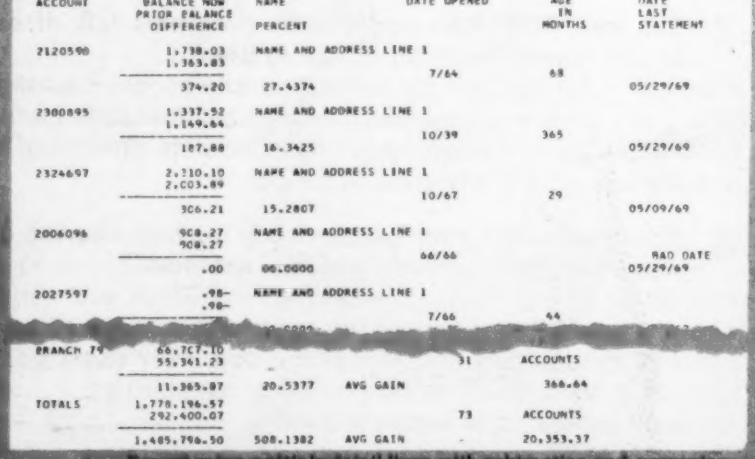
1 Report produced with only three simple parameter cards using CULPRIT's powerful defaulting options for ultra-fast response and for non-programmer use.



REPORT NO. C9 — AUDIT CONTROLS — 05/18/70 PAGE

	NO.	AMOUNT
INPUT TAPE	171	1,517,121.70
LEDGER CONTROL		1,517,121.70
SELECTED	57	208,809.16
INPUT TAPE	158	2,243,260.36
LEDGER CONTROL		2,243,260.36
SELECTED	100	1,459,210.64
INPUT TAPE	161	1,111,919.16
LEDGER CONTROL		1,111,919.16
SELECTED	100	1,459,210.64
INPUT TAPE	131	1,202,153.93
LEDGER CONTROL		1,202,153.93
SELECTED	100	1,459,210.64
INPUT TAPE	155	2,535,462.75

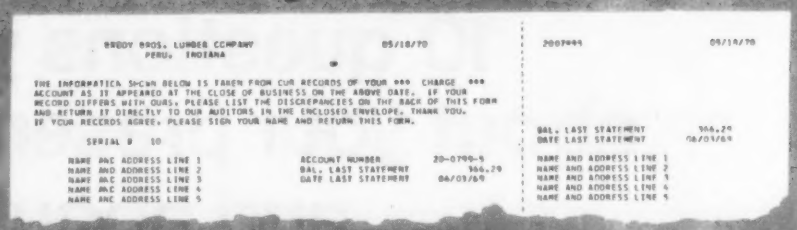
2 Control report summarizing data on audit tape also produced in this run, using selection, multiple-line detail, counting, and calculation.



BRANCH 79 — LARGE BALANCE INCREASE ANALYSIS — 05/18/70 PAGE 7

ACCOUNT	BALANCE NOW / PRIOR BALANCE / DIFFERENCE	NAME / PERCENT	DATE OPENED	AGE IN MONTHS	DATE LAST STATEMENT
2120598	1,738.03 1,363.83 374.20	NAME AND ADDRESS LINE 1 27.4374	7/64	68	05/29/69
2300895	1,337.52 1,149.64 187.88	NAME AND ADDRESS LINE 1 16.3425	10/39	365	05/29/69
2324697	2,310.10 2,003.89 306.21	NAME AND ADDRESS LINE 1 15.2807	10/67	29	05/09/69
2006096	908.27 908.27 .00	NAME AND ADDRESS LINE 1 00.0000	66/66		BAD DATE 05/29/69
2027597	.98- .98-	NAME AND ADDRESS LINE 1	7/66	44	
BRANCH 79	66,767.10 55,361.23 11,365.87	20.5377 AVG GAIN	31	ACCOUNTS 366.64	
TOTALS	1,778,196.57 292,400.07 1,485,796.50	508.1382 AVG GAIN	73	ACCOUNTS 20,353.37	

3 Report using multiple detail lines with subtraction and percentage calculation, variable in header, non-standard decimal and zero editing, test for range with bad-data note, more calculations on totals, and sequenced in descending order of calculated percentage.



BRODY BROS. LUMBER COMPANY — PERU, INDIANA — 05/18/70

THE INFORMATION SHOWN BELOW IS TAKEN FROM OUR RECORDS OF YOUR 000 CHARGE 000 ACCOUNT AS IT APPEARED AT THE CLOSE OF BUSINESS ON THE ABOVE DATE. IF YOUR RECORD DIFFERS WITH OURS, PLEASE LIST THE DISCREPANCIES ON THE BACK OF THIS FORM AND RETURN IT DIRECTLY TO OUR AUDITORS IN THE ENCLOSED ENVELOPE. THANK YOU. IF YOUR RECORDS AGREE, PLEASE SIGN YOUR NAME AND RETURN THIS FORM.

SERIAL # 10

NAME PAC ADDRESS LINE 1
NAME AND ADDRESS LINE 2
NAME AND ADDRESS LINE 3
NAME AAC ADDRESS LINE 4
NAME ANC ADDRESS LINE 5

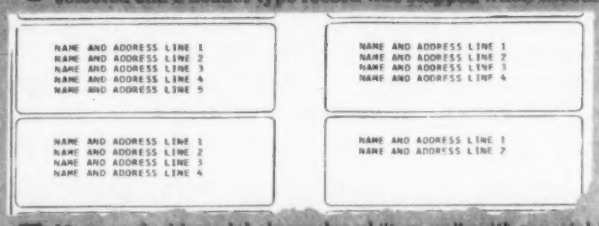
ACCOUNT NUMBER 20-0790-9
BAL. LAST STATEMENT 366.20
DATE LAST STATEMENT 04/09/69

2007999 — 05/18/70

BAL. LAST STATEMENT 366.20
DATE LAST STATEMENT 04/09/69

NAME AND ADDRESS LINE 1
NAME AND ADDRESS LINE 2
NAME AND ADDRESS LINE 3
NAME AND ADDRESS LINE 4
NAME AND ADDRESS LINE 5

4 Report showing use of multiple header and detail lines to produce complex audit notice. Every third record on file was selected and a header type record was skipped when encountered.



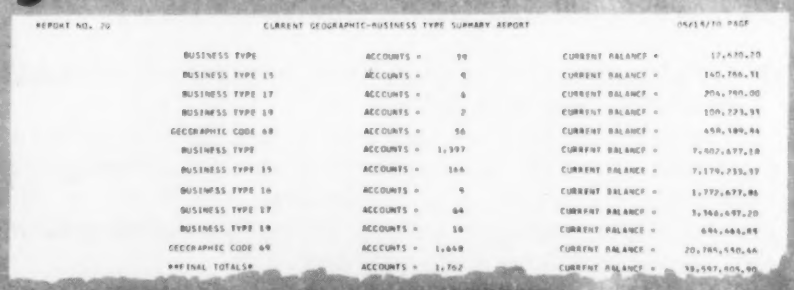
NAME AND ADDRESS LINE 1
NAME AND ADDRESS LINE 2
NAME AND ADDRESS LINE 3
NAME AND ADDRESS LINE 4
NAME AND ADDRESS LINE 5

NAME AND ADDRESS LINE 1
NAME AND ADDRESS LINE 2
NAME AND ADDRESS LINE 3
NAME AND ADDRESS LINE 4

NAME AND ADDRESS LINE 1
NAME AND ADDRESS LINE 2
NAME AND ADDRESS LINE 3
NAME AND ADDRESS LINE 4

NAME AND ADDRESS LINE 1
NAME AND ADDRESS LINE 2

5 Name and address labels produced "two-up", with a variable number of address lines. Special forms are easily handled.



REPORT NO. 79 — CURRENT GEOGRAPHIC-BUSINESS TYPE SUMMARY REPORT — 05/18/70 PAGE

BUSINESS TYPE	ACCOUNTS =	99	CURRENT BALANCE =	17,430.20
BUSINESS TYPE 15	ACCOUNTS =	9	CURRENT BALANCE =	140,786.11
BUSINESS TYPE 17	ACCOUNTS =	6	CURRENT BALANCE =	204,790.00
BUSINESS TYPE 19	ACCOUNTS =	2	CURRENT BALANCE =	100,723.33
GEOGRAPHIC CODE 68	ACCOUNTS =	96	CURRENT BALANCE =	498,189.84
BUSINESS TYPE	ACCOUNTS =	1,397	CURRENT BALANCE =	7,602,677.10
BUSINESS TYPE 15	ACCOUNTS =	166	CURRENT BALANCE =	7,179,735.17
BUSINESS TYPE 16	ACCOUNTS =	9	CURRENT BALANCE =	1,772,677.86
BUSINESS TYPE 17	ACCOUNTS =	64	CURRENT BALANCE =	3,368,697.20
BUSINESS TYPE 19	ACCOUNTS =	10	CURRENT BALANCE =	694,464.89
GEOGRAPHIC CODE 69	ACCOUNTS =	1,648	CURRENT BALANCE =	20,784,540.66
##FINAL TOTALS##	ACCOUNTS =	1,762	CURRENT BALANCE =	38,597,805.90

6 Report produced using totals-only option of CULPRIT and use of level control to specify different legends to be printed at different control breaks.

7 Tape output containing condensed records of those accounts selected for audit verifications.

8 Punched cards . . . again for audit-selected accounts.

Why is CULPRIT the software sensation of 1970?

Look above for one answer: CULPRIT not only handles complex one-time reports, but production reports as well, because it can produce many report outputs in one pass of a master file.

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A file format is needed for the input file, together with the major characteristics (record size, block size, record type, label type, sequence and approximate number of records). The master file should be very low volume. We prefer nine-track tapes at a density of 800 bpi. We can also accept others, but we *must* know what you are sending us. A tape dump is useful, also.

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Mini Acts as a Batch Terminal With 360 Package

By Don Leavitt
CW Staff Writer

MELVILLE, N.Y. – Any minicomputer reportedly can be used to communicate, over telephone lines, with a System 360, through a software package available from Digiscan Services Inc. With the package, the minicomputer acts as a remote batch terminal, and the 360 as the central processor.

A byproduct of the package is the capability it provides for otherwise incompatible minicomputers to communicate with one another. In this instance, each operates as if it were sending to or receiving from a 360, and makes the necessary adjustments, even though there is no 360 on the line.

Resides in Mini

The developer said that the package, which resides in the minicomputer, is remarkable because it simulates the 360 communications hardware. This allows the 360 programmer to use the IBM Btam communications conventions governing 360 to 360 transmission, when he wants to communicate with the minicomputer.

Within the minicomputer, the Digiscan package is said to control the entire transmission sequence, including handshaking necessary to establish line discipline, data transmission, data reception, and transmit and receive capability in the same cell.

Data transmission is carried on in binary synchronous mode, normally in Ebcdic code. The company said that the package can be adapted to transmit in Usasi II code.

Routines to service input/output on an auxiliary storage medium are also included in the package, according to Digiscan.

The company also said that the package can be adapted for use in situations where one minicomputer acts as the central computer and communicates, over telephone lines, with any other minicomputer that has the package.

In these circumstances, the central minicomputer would have to control the flow of data from the other units. It might, in turn, be used to pass along the pooled data to a 360 that controlled and pooled information from several of these mininets.

Modem Interface

Digiscan said that for implementation of the package, the modem interface on the minicomputer must be IBM-compatible. Circuitry for reverse channel capabilities would be unnecessary since the 360 communications processing does not make use of the reverse channel, the firm said.

The minicomputer would also have a tape unit, disk drive, or other form of auxiliary storage device, the company said.

The 360 to which the minicomputer is being tied by the Digiscan package must have a 2701 Data Adapter Unit with an SDA II adapter, in addition to a data set and at least the minimum hardware configuration needed to support IBM's Btam communications control system.

The package has already been implemented on the Compat 88-23 computer/terminal. Adaptation to other minicomputers can be completed within four to six weeks, the company said.

The package is expected to cost "under $10,000" with the exact price depending on the amount of work required to make the adaptation to a particular minicomputer. A company spokesman said that, once purchased, the package could be copied and used throughout the buyer's DP network.

He also noted that the cost of development for any adaptation would "probably" be shared by all parties interested in the particular machine. In effect this could mean that the first purchaser would be given a partial refund as others buy the initial development.

Digiscan Services Inc. is at 425 Broad Hollow Road.

SBC Adds Time-Sharing Capabilities For Call/360 With 'National System'

WHITE PLAINS, N.Y. – Organizations with offices or plants across the country can share programs and data in one central computer by using National System, a time-sharing service available now from Service Bureau Corp. (SBC), an IBM affiliate.

In concept, SBC's National System is similar to a number of other services, such as GE's Mark II and United Computing System's UCS VI networks.

The National System is described by SBC as a major addition to its Call/360 service, which until now has provided time-sharing capabilities on a localized basis. Without the National System, Call/360 users had each of their locations tied into a separate computer, with no possibility of interactively sharing a common data base.

National System is based on a 360/50 in SBC's Cleveland data center. Subscribers in eight major metropolitan areas can use IBM 2741s or compatible terminals to tie into the system through existing SBC-leased telephone lines, by dialing a local telephone number.

Cities now in the network are New York, Chicago, Cleveland, Los Angeles, San Francisco, Houston, Philadelphia, and Pittsburgh. Users outside these cities can reach the Cleveland computer by dialing the nearest network access point, the company said.

Although SBC has nearly 40 local phone call areas under the standard Call/360 service, the company said that it has no plans at present to extend the National System beyond the eight areas listed.

SBC's full library of application programs is said to be available on the new system, as are the standard Call/360 languages: Basic, PL/1, and Fortran.

The company said that a user's data base can be read from multiple locations simultaneously but that a security system prevents disclosure of the data to unauthorized persons. An SBC spokesman said that the system includes a control file through which all inquiries pass. The purpose of the file, he said, is to indicate which fields are being updated and to delay access to these fields until the updating has been completed.

Users can access the system for the normal Call/360 at a minimum monthly charge of $100, in addition to terminal and local telephone line costs. Standard Call/360 charges of $9/min for CPU time and $1.50/half-track/mo for disk storage apply also in the National System. Connect time charges, however, are up to $13.80/hr under the National System, compared to $11/hr under normal Call/360.

GE's Mark II network is available through 42 cities. Charges for this system, also based on a computer in Cleveland, are $7/hr for connect-time, $.25/1,000 characters for I/O, and $.33/computer resource unit (based on usage times and applications).

United Computing's UCS VI network, based on a CDC 6400 in Kansas City, has no monthly minimum charge. Connect time costs $15/hr. CPU time charges depend on the amount of core used. If use is limited to less than 81,900 characters, there is no charge. Programs using between 81,900 characters, and 163,800 characters cost the user $.30/sec, while programs larger than that cost $.60/sec. UCS charges $.50/1280 char/mo for storage of data.

H1648 Time-Sharing Users Receive Easy-to-Use Text-Editing Language

MINNEAPOLIS – A text-editing language that provides in-depth analysis, program tracing, file scanning, data retrieval, total error correction, and sub-file generation has been introduced for Honeywell H1648 time-sharing users.

Simple Instructions

The Edit Language, supported by Honeywell's Information Services Division, (ISD) is said to be guided by simple user instructions. ISD developed the monitor and the user-oriented documentation.

One major advance in file maintenance is Edit's ability to save typing time, the firm said. An incorrect character in a complicated equation can be corrected without retyping the entire equation. In addition, if the erroneous character or expression appears in many lines of the file, all will be corrected without further action by the user.

A tracing feature allows the user to interrogate his file for any or all occurrences of a given character, phrase, or expression. This "instantaneous" scan is invaluable in debugging a program, the company said.

At the user's command the scan goes one step further. All characters or expressions found to match the user's search argument are modified, deleted, or copied to another file. A single instruction from the user accomplishes all this. Thus one master file is edited to create a corrected master file, satellite files or free-standing subroutines, Honeywell said.

A feature of the Edit scan is described as a data retrieval mode. Specially prepared data files are interrogated for a key word in the text. For example, an inventory file is searched to produce all information involving pricing, stock levels, or components that is relevant to "Part-A." Although the information is scattered throughout the file, one instruction yields all of the information.

Automatically Framed

Output is said to be automatically "framed" on the paper of the terminal printing unit for later shearing into pages. Each 8-1/2 in. by 11 in. frame has a preprinted page number and all pages carry the document title. This makes it easy to file or reproduce the document, Honeywell said.

The company said that users of the H1648 systems can operate with Teletype ASR33 or 35, Execuport, Dataport, or other compatible terminal units.

Available immediately, the Edit package is provided at no cost to H1648 users. The company said that all Edit options are fully described in a user's manual that is designed as both a training and reference aid.

Cross-Reference Listings Output With Cobol Program

WILBRAHAM, Mass. – Cobol programmers can have cross-references printed as a line-by-line part of their program listings with Cobol-Map, a documentation system available from Pioneer Data Sciences for less than $200.

The Cobol-Map system follows some conventional Cobol notations such as a reference directory that indicates, by line number, all references to every data and procedure name. This listing, however, is organized alphabetically, rather than on the sequence in which the label origins are encountered in the program.

In the program listing itself, Cobol-Map adds new elements. In addition to a standard printout of every source statement, the system charts bidirectionally the label references to and from each statement of the program, to the right of the statement.

At the origin of each symbolic label, whether in the data division or the procedure division, Cobol-Map provides a table of all line numbers that make reference to that label.

At each statement that refers to symbolic labels, Cobol-Map lists the line number of label origins, in the order of their appearance in the statement.

According to Pioneer, these references from the program statements back to the label origins mean that Cobol-Map is a true cross-reference guide. It provides, the company said, the same amount of information normally offered by a combination of conventional cross-reference list, flow-chart, and program list.

Functionally, Cobol-Map operates as a precompiler run, with its output becoming the input to the Cobol compiler itself. The alphabetic reference listing is produced during the precompile pass, but may be omitted at the user's option.

The user has to disable the normal card image printout, in favor of the enhanced Cobol-Map listing, during the Cobol compilation.

Pioneer said that the present version of the Cobol-Map system adds between 50% and 100% to the overall time of compilation.

The complete system consists of three programs, two IBM DOS sorts and a compiler interface. The purchase price of $199.95 includes complete documentation and a year's maintenance of the system.

Pioneer Data Sciences address is Box 236.

Program Estimates Costs

WHITE PLAINS, N.Y. – A construction estimating program said to allow the IBM 1130 system to produce a summary of cost estimates for an entire building project as well as any of hundreds of separate cost factors involving labor, material and equipment, is available from IBM.

Cryptographic Package May End 360 Program Thefts

NEW YORK – Theft and tampering with computer programs can be virtually eliminated by the use of a package called Auto-Source, according to the developer, Rapid Response Systems (RRS). The package is designed for 360 users.

Auto-Source uses cryptographic techniques to scramble the source coding of the programs it protects. Anyone stealing a program from the Auto-Source library would have a meaningless hodge-podge, the company said.

Passwords are used to prevent unauthorized access and modification to programs being maintained by the system. The passwords would only be given to authorized personnel and can be changed as frequently as security dictates.

Increased programming efficiency is said to be another benefit of the package. Auto-Source allows programs to be revised by the use of control cards, showing which source statements are to be added, changed or deleted.

RRS said that Auto-Source is unique because it maintains within the library a complete record of each version of a program.

Changes in each program reassembly are tagged with an automatically generated sequence number.

This technique serves two purposes, according to RRS. Since the step-by-step changes are available in storage, any desired version of a program can be regenerated by a simple console command. Although any version of a program can be accessed, none of the versions in the library can be altered. Changes are tagged with a new version number and cannot be slipped into an existing version, the company said.

Unauthorized Tampering

Unauthorized tampering with a program by patching of the object module can also be spotted by the Auto-Source system. The company explained that the Mini-Exec feature can be used to compare the coding in the object program as stored with the coding that would be generated by the source program, and highlight any discrepancies.

This type of monitoring can be done at any time and with any program, RRS said, so management has a true audit tool with the Mini-Exec.

The system provides operating efficiency as well as security, the company said, in that the programs are stored on disk in compressed format. By eliminating blank characters from the stored data, RRS said, the user has more disk storage area available for programs.

The developer said that the scrambling of the source programs is done with classical cryptographic methods involving polyalphabetic substitution. Using random number generators, each character in each source statement is enciphered, and the key to deciphering is generated and stored along with the encoded statement.

Assembler Language

Written largely in Assembler Language, with minor elements in Cobol, the Auto-Source system is operational on the 360/25 and higher, under DOS or OS, with a 32K partition and either a 2311 or 2314 disk unit. The developer said that minor alterations might be needed to make the system operational on RCA Spectra 70 or Univac 9000 series central processors.

The system costs $4,800 which includes installation and training of the user's programmers and operators. RRS said that it will fully maintain all versions of the Auto-Source package. Delivery time is a week, a spokesman added.

Rapid Response Systems Inc. is at 1040 Sixth Ave.

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That's New Tab Reelgard! Exclusive Reelgard one-piece construction assures the ultimate in safe magnetic tape storage, even if you are using open aperture reels. The hinges, hanging hook and positive Reelgard locking system are molded into a thin 3/32", high-impact, shatter-proof polypropylene case. Reelgard keeps magnetic tape reels from resting on their edges, to prevent possible damage to the tape and to eliminate the danger of dropouts, with a molded-in support. When the Reelgard container is open, the design of the container permits grasping the reel by the hub for safe, proper removal of tape. A very tight, positive tongue and groove closure gives added protection against contamination damage. The Reelgard snap-latch opens easily with a snap of the fingers. There's no more fighting fit and suction as in old fashioned two-piece tape cases. When it comes to saving you precious magnetic tape storage space, Reelgard benefits you even further. Compared to conventional two-piece canisters, Tab Reelgard containers can accommodate 60% more magnetic tape in the same space, for half the cost! Whether you are hanging magnetic tape or storing it on shelves, Reelgard combines with proven Tab magnetic tape storage systems to help you store more, safer, in less space. With Tab Unit Spacefinder tape storage systems, new hanging racks are available for Reelgard in either 30" or 42" wide assemblies. If you want closed cabinet storage for your tape, new hanging Reelgard racks or conventional wire racks can be used in Tab Data Media Cabinets. For complete information about new Tab Reelgard tape containers, call your local Tab Products representative. Snap to it! Tab Products Company, 2690 Hanover Street, Palo Alto, California 94304

TAB PRODUCTS CO.

IBM Improves DOS Sort/Merge

WHITE PLAINS, N.Y. – Disk sorts will reportedly operate from 4% to 40% faster under a new IBM DOS Sort/Merge program, designated as the 5736-SM1.

With the program the degree of performance improvement over the existing 483 Sort/Merge program depends on the amount of core storage allocated to the task. A minimum of 10K core is required with the new package, the company said.

The 5736-SM1 is said to include all the features and options of the 483 Sort/Merge. IBM said that 483 program would continue to be available.

The 5736-SM1 Sort/Merge program will be available this month for $80/mo under a license agreement.

Credit System Licensed To Systems General Corp.

LOS ANGELES – Electronic Currency System, a proprietary system licensed to Systems General Corp. for operation, is a universal computer-based retail credit system embracing features of credit cards, instant credit reporting, data processing, accounting services, and demographic market research.

Systems General Corp. is located at 1089 Wilshire Blvd.

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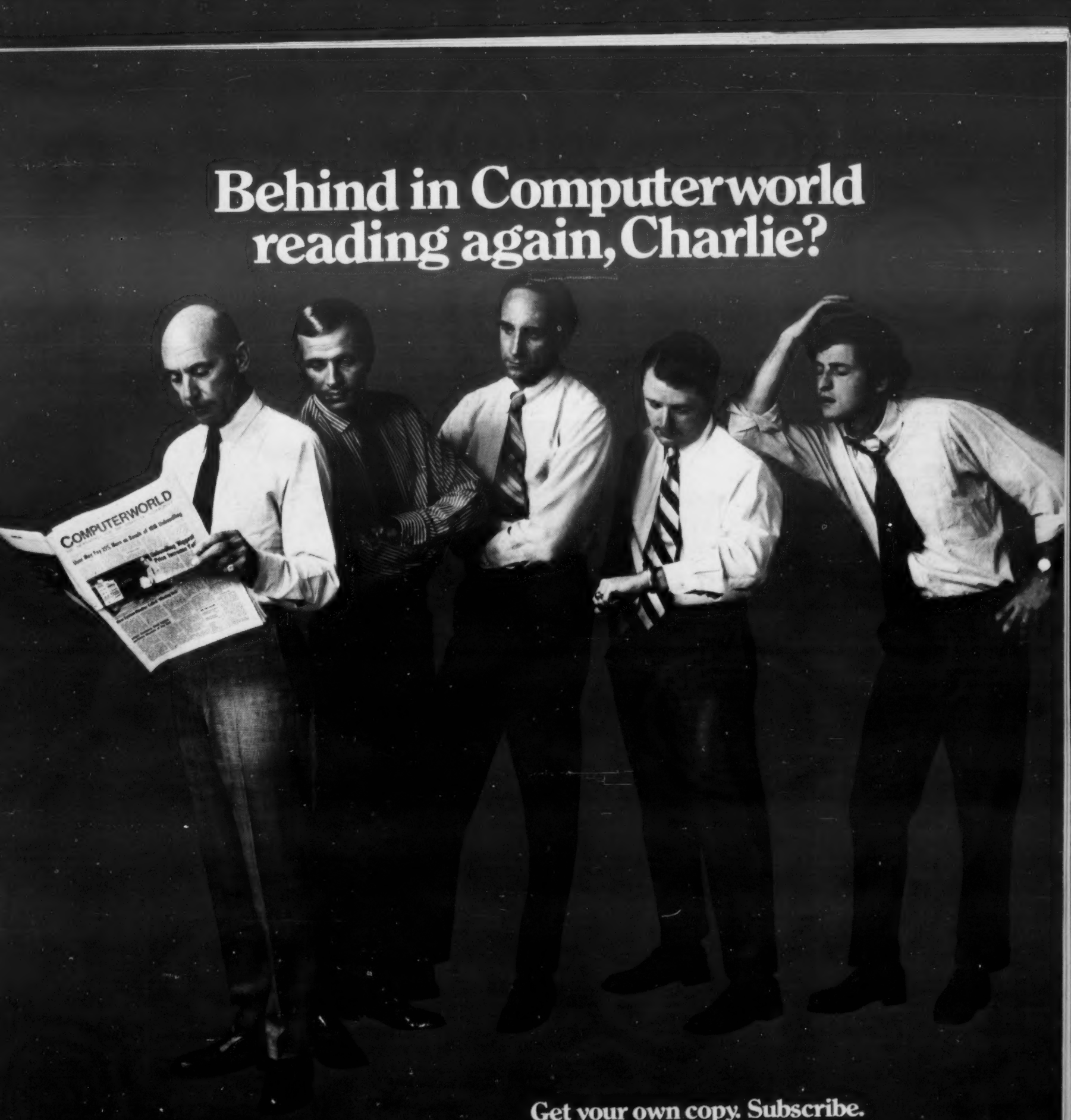

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COMPUTERWORLD

societies

Afips Slates FJCC as Award Site For Goode Memorial Presentation

MONTVALE, N.J. – The seventh annual presentation of the Harry Goode Memorial Award will be made this November at the 1970 Fall Joint Computer Conference, Nov. 17-19, in Houston. The award, sponsored by the American Federation of Information Processing Societies (Afips), is presented to honor and encourage outstanding contributions in the field of computers and information processing.

According to Brian Pollard, chairman of the Harry Goode Memorial Award Committee, "Eligibility is restricted to outstanding living contributors whose work fulfills one or more of the following criteria:

- A single outstanding contribution of theory, design, or technique.
- The accumulation of recognized contributions over an extended time period.
- Outstanding contributions in education through academic activities or associated writings.
- Publication or editing of outstanding papers or books on theory or practice which has had an important influence."

The award honors the memory and contributions of Harry H. Goode whose death 10 years ago deprived the computer field of one of its leading pioneers. At the time of his death, Goode was chairman of the National Joint Computer Committee – the predecessor organization to Afips.

One of the first scientists to fully comprehend the power and capabilities of computers, Goode formulated many principles of system engineering and developed techniques for design, analysis, and evaluation of large-scale systems.

Congress Given Systems Seminar

WASHINGTON, D.C. – Computerized information systems took the spotlight recently in the U.S. Senate caucus room as Afips and the Association for Computing Machinery (ACM) presented a one-day seminar for Congressional personnel.

The seminar covered current developments and expected future expansion in the computing field and included material relating to the potential uses of information systems by the Congress. It was attended by about 35 Congressional staff members and governmental representatives.

According to Louis Feldner, chairman of the ACM Congressional Seminar Committee, "The purpose of the seminar was to provide objective information on present and anticipated future uses of information systems and to promote increased dialogue on the impact of such systems on our economic and social life. We believe that these objectives will be reinforced through the publication and distribution of the seminar proceedings by Afips Press.

DP Users Urged to 'Set Sights Higher'

WASHINGTON, D.C. – "A lag in conceptual thinking by modern-day computer users has diminished the v ue of computers in many fields," a computer expert told nearly 100 users at the recent Honeywell Council for Advance Programming (CAP) meeting here.

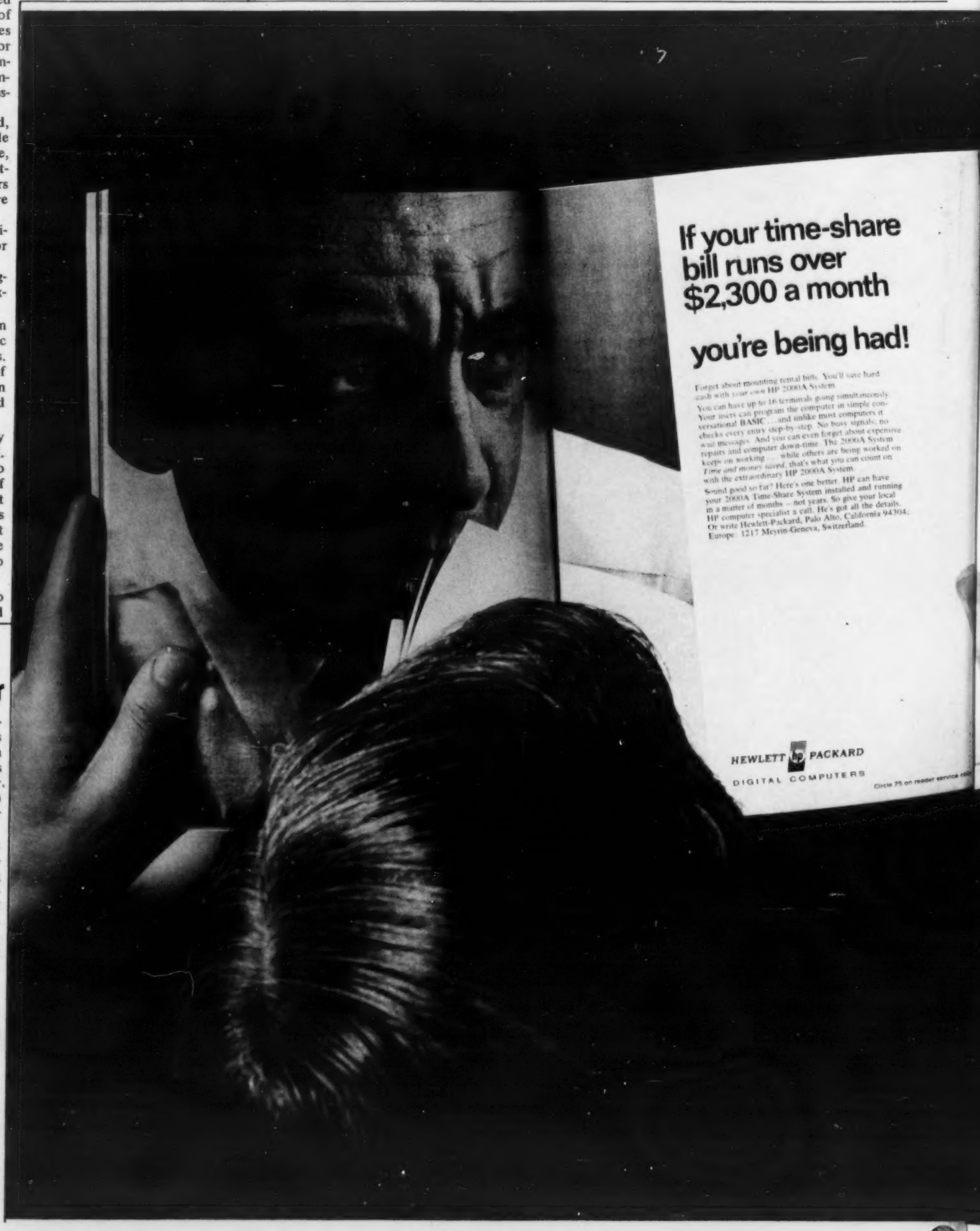
Dr. Uta C. Merzbach, curator of mathematics at the Smithsonian Institution, said that, "Since the 1950s, users have been preoccupied with technological and functional innovations. But from here on in, they must discipline themselves to pay more attention to conceptual aspects as well, if any new breakthroughs are to be realized in computer usage and development.

"Users must set their sights higher and work more closely with both manufacturers and specialists in their field in order to have the computer perform the higher level functions it is capable of."

She also noted that, "The humanities and social science fields have been hampered by the notion that the computer must be applied only to quantitative studies.

"Users have been caught between two extremes – on the one hand, they have grandiose ideas of implementing esoteric applications, but then they resort to the 'rock bottom reality,'" which, she felt, was "far below the level at which users should be thinking."

Merzbach attributed this low level of development to "too narrow a specialization of applications in various fields. This has kept the programmer from grasping the 'theoretical underpinning' of the subject matter he is applying the computer to."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Era of 'Quick-Buck Artist' Ending

Midwest, Job-Seeking Youth Keep Eye on DP Schools

By Thomas J. Morton
CW Midwest Bureau

CHICAGO – The Midwest, with its heavy accent on industry and the resultant grand scale industrial computerization, is keenly aware of data processing and the job opportunities data processing offers its citizens.

The young, especially those who feel themselves scholastically or financially unqualified for college, have looked upon data processing as a godsend, an opportunity to better themselves in a field they have become sure they can master. This awareness of the community, coupled with the eagerness of the young to enter the field, has produced the need for the computer training school. With the real need came the opportunist, and the slam-bang computer school was born.

But the era of the "quick-buck artist" is ending. In Indiana, complaints from Evansville, South Bend, Hammond, and Indianapolis to the state superintendent of public instruction spurred an investigation. In Evansville, one computer school,

Education

Automation Training School, Inc., was sold to another, Tri-State Computer School Inc. That was last January. The school closed in March, with no warning to its students, who signed contracts for $1,300 and made down payments of $195.

The contracts to Tri-State were sold to Imperial Finance Corp., which said that efforts are underway to get the students into another school for their training, but that the contracts and the monthly payments of $79.74 were still valid.

The owner of the Evansville branch of Tri-State, Robert Postle, was also named in the complaints from Indianapolis and South Bend. The complaints stated that the students received little or no actual instruction and little practice on equipment. Most of the complaints were filed by parents of the students.

A spokesman for the Indiana Department of Public Instruction stated that Indiana had no laws regulating the computer schools. There is no financial responsibility statute, nor are there standards set forth concerning computer school curricula or teacher certification. The spokesman added that a study is under way in the state to develop these standards.

In the immediate Chicago area, there have been no unannounced school closings. *Computerworld* learned that the computer programming center here has been "put on the block." The school would either be closed or sold, CW was informed, and the students would be trained at another school.

In Illinois, the state vocational and business school act, which went into law as of January, 1969, requires that a school provide a $10,000 surety bond for financial responsibility, and that the school's teachers have at least three years' experience in the field or a related degree before they can be certified. No curricular standards are set by Illinois as yet, but a standards committee is researching that area.

Not the Best Reputations

Computer schools in the Midwest do not have the best of reputations. A spokesman for the state employment service, when queried on the employment prospects in the area, said: "We get a lot of people who have been to some of those fly-by-night computer schools. Most employers don't feel the training qualifies them for much at all, other than computer operators, maybe."

Selective Service pointed out that some young men still have the erroneous idea that enrollment in a computer school qualifies them for a draft deferment. A representative of Selective Service pointed out that, "We are not giving out 2A occupational or 2A student deferments at this time."

While the way has not yet been cleared for the sincere school with a real feeling for the student and the computer industry in the Midwest, it's getting harder and harder for the opportunist to make his "fast buck."

Last year this ad offered you the best time-share buy on the market.

Now we've got an even better deal. Our new system handles twice the users for just $2667 a month.

Last year, we had one Time-Share system that made a lot of sense to a lot of people. Now, we've got two! Our new HP 2000B System does an even better job of holding the line on rising time-share costs. It handles 32 users simultaneously. Twice as many as its "little brother" (HP 2000A)—for only a third more cost.

Of course, if you already have a 2000A (or only need a 16-terminal system right now), you can upgrade to 32 terminals any time you're ready. Either way, you'll still have the best time-share buy on the market.

Both systems provide the advantages of HP BASIC, easiest programming language around. More scientists, engineers, educators and businessmen are using it every day. To make the 2000B even more useful, some new language features have been added. Like chaining (where one program calls in another automatically). Common storage for simplified programming. And doubled data file capability, for access to 16 files simultaneously.

Sound good so far? Here's more. Our 2000B, complete with custom software, control teleprinter and all 32 terminal interfaces, costs just $124,050. Or $2667 a month on our new five-year lease plan. And if you want to start with a minimum investment, our HP 2000A is only $93,750. And don't forget what we said about upgrading!

For all the details, contact your nearest HP computer specialist. Or write to Hewlett-Packard, Palo Alto, California 94304; Europe: 1217 Meyrin-Geneva, Switzerland.

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Antioch College Awarded $43,700 Grant From NSF

YELLOW SPRINGS, Ohio – Antioch College has been awarded a $43,700 National Science Foundation grant to support a "Program for Academic Computer Usage Development."

Richard N. Carpenter, assistant professor of chemistry, will spend the next academic year at System Development Corp. in Santa Monica, Calif. He will research methods to improve Antioch's use of computers in its academic program [CW, May 6].

Computer Science Changes Foster 'New Knowledge'

Dr. John Maniotes is the chairman of the computer technology department at Purdue University. He claims that one example of "biased and one-sided criticisms" of programming training by academic institution's concerns the comments made by Dr. R.W. Hamming and Dick Brandon at the UCLA symposium March 30-April 1 [CW, April 8]. In this first of a two-part series, Maniotes describes changes made in the computer science instructional programs in the past five years.

Many of the remarks given by Hamming and Brandon regarding the training of programmers at academic institutions are inaccurate and are not based on any substantial evidence or facts. Statements such as "programmers are illiterate" and "they do whatever they want to do without regard for what is needed" are certainly false and do not serve the best interest of the programming profession. It seems that individuals who criticize the training being given at academic institutions should do their homework before making erroneous statements.

Three Types of Schools

Currently in the U.S. there are three types of institutions (schools) which supply industry with the majority of those individuals classified as computer programmers. For lack of better terminology, I would classify the programs in these schools as follows:

- The four-year computer science (CS) programs which are concentrated at major universities.
- The rapidly growing two-year computer technology or data processing programs which are concentrated in vocational institutions, colleges, and in some universities which either lack CS programs or permit both the DP and CS programs to coexist.
- The so-called private commercial schools, many of which have been established through franchising, and which usually offer training ranging from three to 12 months.

During the past five years, many CS programs at various universities abdicated their place in the training of computer programmers. Some CS programs concentrated in training numerical analysts who were quite good in handling axioms, lemmas, theorems, and proofs but didn't know how to apply their CS knowledge to solve industrial type problems. Other CS programs concentrated their efforts towards producing researchers and students for their graduate school programs who were quite thoroughly trained in the theoretical aspects of computer science, but their training left much to be desired in the practical aspects of their specialty.

Change of Content

What really has taken place during the last five years is that

Viewpoint

the new knowledge produced by research is finding its way into the CS instructional programs through curricula and course changes. This is a dynamic process which is constantly increasing in tempo. As new content, usually more abstract in nature, is included, other content, usually more applied in nature, is eliminated. Sometimes this content which is crowded out is no longer "socially" useful to CS programs.

This is what has happened to the so-called practical level EDP orientated courses that CS programs once had. Hence, it is no wonder that many CS undergraduates cannot program, let alone apply their limited practical CS knowledge to solve industrial-type problems! Applied industrial-type programming is no longer socially useful in CS programs, and the way trends are going it probably never will be.

Also during the past five to seven years, a few hundred two-year Associate in Applied Science (AAS) programs in computer technology or data processing were established at various vocational institutions, colleges, and at some universities. The main objective of these programs has been to produce a graduate in the occupational group that begins with the computer programmer in either the commercial or technical areas of programming. (Some of the DP programs produce operators and coders as a byproduct, but this is not usually their intent.)

These two-year DP programs have moved into the vacuum created by the exodus of the four-year CS programs by assuming the responsibility of those elements of knowledge which no longer serve a function in the more theoretical CS curricula but which must be perpetuated in a technological society such as ours.

Maniotes' second article will pinpoint the training, emphasis, and value of the two-year DP program as well as the deficiencies found in private commercial schools.

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Management Insecurity Creates Low Morale Problem

By Michael D. Weiss
Special to Computerworld

It is imperative that management develop a more realistic attitude towards data processing and its problems, and more fully appreciate what DP personnel are trying to accomplish.

One of the points in Rohan's article was, "The need for documentation gave birth to the DP systems analyst." I do not feel this is true. The programmer's attitude appears to be: "What do you need the systems analyst for? I'm a programmer and I can do the job."

I define this assumption as the "Programmer Syndrome," the feeling a programmer gets when you mention "systems analyst." I've seen many projects fail based on what a programmer has done.

Objectivity

A systems analyst can contribute to a project what a programmer can't – objectivity. The programmer's thinking processes are too narrow and technically geared to be able to allow him to communicate with the user department.

Someone has to be able to support both the user department and the programmer, and maintain proper project control. This is, and should be accomplished through, the systems analyst.

The statement, "Being an inadequate manager is not the individual's fault or problem but that of his superiors," is not totally true. A man is responsible for his own self-development, relying only on his company for help and support.

In organizations which are smaller than IBM, training programs are nonexistent, and I personally find it appalling that a man in a management position should not be liable for his own development. Another point that should be made is that ineffective management exists in all divisions of a corporation, not only in DP.

Michael D. Weiss reflects on the views expressed by Kenneth Rohan [CW, April 29] in the article titled "Source of EDP Personnel 'Shift' Problem Is Poor Management." Weiss suggests a "meeting of the minds" between DP professionals and management. Weiss has served as a systems analyst and programmer in the banking, finance, manufacturing, and credit card industries. Currently he is a supervisor in the systems area for a credit card organization.

Viewpoint

Morale Is Symptom

The confusion created by free interchange of the use of the words "morale and insecurity" should be immediately rectified. "Poor personnel review handling, shoddy salary administration, inept budgetary practices, and lack of management consistency" are symptoms contributing to morale problems, and are the effects of insecurity. The implication in the article is the opposite.

Insecurity of a manager is a problem which, in turn, creates another problem – poor morale. Top management treats morale as its problem rather than a symptom of the real problem – ineffective management.

The reasons that companies have problems with their data processing installations is the inability of management to understand fully what a computer is. The ultimate reporting channel in most organizations is someone who has no knowledge of data processing.

Top management's thinking has to be clearly reversed for the effective DP professionals to create a successful atmosphere. The easiest and quickest method to turn around these ideas is for the DP professional to formally train management in the gray world of data processing.

Data processing exists in a world of its own, and it shouldn't. People hear "computer" and they shudder, not realizing that it's only a tool to be used. People are brainwashed because of the engineering complexities of machines rather than by their effective use as a tool for processing data and as a guide to decision making.

Another point which comes into consideration is the time element. Top management, for the most part, doesn't understand the reasons why it takes so long to realize effective results from a systems and programming project. Their thoughts are usually that "everything should take two weeks."

Of course, there's the other side of the fence – ineffective DP management expounding the 12-month theory. Together, both theories have gone a long way in alienating the DP unit from other areas in the organization.

There must be a happy medium somewhere. A meeting of the minds must be established. All too often EDP people expound technical jargon and concepts and leave management entirely bewildered.

The EDP professional should approach management on its level with clear, concise, and complete details. Management, in turn, should show enough confidence in the DP people it has hired to run the installation, barring any unforeseen circumstances.

We must always remember that not everything is black and white. There is always the gray area to consider.

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The International Computer Personnel Registry is a *confidential* information bank of basic data about computer professionals who *may* be available if a better opportunity presents itself. This new concept has been developed by a team of data processing personnel experts at Computer Personnel Consultants, Inc., a firm specializing exclusively in data processing personnel with offices in major U.S. cities and wide overseas affiliations.

All information, except your name, address and present employer, will be entered in the Registry. Employers who subscribe to the Registry will have access to its data in filling their needs for qualified computer professionals. If your qualifications are selected, a CPC staff member will personally telephone you and identify the interested employer. Then, and only if authorized by you, your name and address will be released and you will be contacted directly by the employer. There is no cost or obligation to you as all charges and expenses are borne by the employer.

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New Literature

Questions and Answers about Action/APL Time-Sharing, a brochure detailing the features of APL (a programming language), is offered by The Computer Co. The folder explains in detail the workings of time-sharing systems generally, and catalogs the user-benefits of Action/APL. The brochure is available at no charge from The Computer Co., Seventh and Franklin Bldg., Richmond, Va., 23219.

A 20-page brochure is available from Infotronics Corp. on its mini/max computer system. The brochure details the architecture, addressing structure, input/output structure, and instruction format utilized by the mini/max. Requests should be addressed to Infotronics Corp., 8500 Cameron Road, Austin, Texas 78753.

A comprehensive 67-page reference manual describing the cd 200 digital computer system is now available from Computer Development Corp. The manual presents detailed information on system design features, system organization, instruction set, memory and input/output characteristics, interrupt structure, and packaging techniques. The cd 200 instruction list, detailed description of formats, instructions and operations for computer functions, as well as tables to show memory modules available, effective address computation, typical instruction execution times, and interrupt level memory addresses are included. All control instructions are graphically shown in their proper format. For copies of the manual contact Computer Development Corp., 3001 Daimler St., Santa Ana, Calif. 92705.

Three sheets on the DGC-300 Data Transfer Systems describe the specific characteristics of the system, give a typical application, and explain the quality assurance procedures. The booklet is available free of cost from Data Graphics Corp., 8402 Speedway Drive, San Antonio, Texas 78230.

Description and performance specifications of the Ampex Model TMC high performance cassette tape drive are contained in a new brochure, C130. The TMC is designed to provide users with a precision on-line storage device for data terminals, minicomputers, data acquisiton and keyboard entry systems. Write Ampex Corp., 401 Broadway, Redwood City, Calif. 94063.

A new 20-page brochure has been released by Micro Systems which describes the firm's Micro 812 communications processor. The brochure describes the 812's capabilities, applications, input/output operation, general specifications, instruction set, and standard operations. Available from Micro Systems, 644 East Young St., Santa Ana, Calif. 92705.

The Full Service Capability, a 16-page illustrated brochure, describes Princeton Time Sharing Services, Inc.'s (PTSS) expanded and integrated approach to a wide range of computing needs based on optimum utilization of computers, programming, and PTSS customers' staffs. Copies of the brochure are available on request from Princeton Time Sharing Services, Inc., U.S. Highway 1, Princeton, N.J. 08540.

The L-64 communications controller is described in a brochure now available from KDI Interactive Data Systems. The product specifications booklet includes a general description, list of options, and a complete functional analysis with illustrations of subsystems configurations and interfaces, power requirements, and environmental requirements. For copies of the literature, contact KDI Interactive Data Systems, Inc., 17785 Sky Park Circle, Irvine, Calif. 92664.

Computer Measurements Co. offers two data sheets, one on its Model 925 Totalizer, and the other on the Model 912 Single Preset Controller. The Totalizer data sheet notes the instrument's 5-digit display, its simplicity of operation, its noise immunity, and its IC design. The Controller data sheet gives complete specifications of the Model 912 and details such typical 912 features as 5-digit display, IC circuitry, simplicity of operation, noise immunity and automatic reset.

The data sheets are available from Computer Measurements Co., a division of Newell Industries, 12970 Bradley Ave., San Fernando, Calif. 91342.

An eight-page brochure describing the IBM 4872 Modem and its application in teleprocessing applications is now available from IBM's Federal Systems Division. Specifications and background information indicate the modem's advantages in transmission of computer data over common carrier lines. Write IBM Marketing Information, 18100 Frederick Pike, Gaithersburg, Md. 20760.

A new bulletin describes the APT services, which use a remote batch computer to prepare numerical control tapes for two-, three-, or five-axis, point-to-point and contouring applications. APT is a general purpose N/C programming system consisting of two components: a language which enables the user to easily describe both simple and complex geometric shapes, desired motion sequences, and matching operations; and a high-capacity computer processing system. For a copy of descriptive bulletin 24-251, write the Westinghouse Tele-Computer Systems Corp., P.O. Box 868, Pittsburgh, Pa. 15230.

A seven-page application abstract explains how, through use of a remote time-sharing terminal device and a special computer program, circuit designers can quickly and efficiently determine where to place components and how to route conductors on integrated circuit boards. Called PWR (for Placement and Wire Routing), the program is one of several that Remote Computing's customers can use for electrical-engineering applications. To obtain a copy of the PWR/RCCR applications abstract, 50-62-030-04R, write: Director, Corporate Information Services, Remote Computing Corp., One Wilshire Bldg., Los Angeles, Calif. 90017.

A six-page bulletin covers Computer Products' CR300 series (12 models) Compureed low-level signal switching relays. Included in this bulletin are complete electrical and mechanical specifications plus brief application notes. Available on request from Computer Products, 1400 N.W. 70th Street, P.O. Box 23849, Ft. Lauderdale, Fla. 33307.

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BUSINESS COMPUTERWORLD INDUSTRY

June 24, 1970

Tab Users Benefit From Growth of Software Services

By Edward J. Bride
CW Staff Writer

NEW YORK – Since IBM unbundled its hardware and software prices a year ago, about a dozen companies have emerged to offer what they call "software services" to users of tab equipment.

It must be a successful idea, since over half of these companies have opened their doors this year.

They buy equipment from first-time users through used-equipment vendors like MAI and then establish punch card installations for businesses which feel that computerization is too expensive, or at least premature for them.

For months, companies like MAI have insisted that unit record is not a dying business, and that System/3 is not the answer for everyone.

Now, some of these dozen companies will design tab installation, wire the boards, provide support and maintenance, and train personnel until user employees can handle the operation.

Cross-Country DP Tour

The companies are located coast-to-coast. One public relations man rattled off a list which sounded like a cross-country DP tour: New York, Chicago, Seattle, San Jose, Los Angeles, San Francisco, and back to Arlington, Virginia.

They provide "turnkey" unit record operations to small- and medium-scale users who may now be using Honeywell, Burroughs, or Friden accounting machines.

And, according to Luther A. Schwalm, president of Management Assistance, Inc. (MAI is a subsidiary), these firms are in a good position to compete with IBM.

Schwalm believes that "the emergence of companies offering systems support for unit record installations will be beneficial to both potential and existing" tab users.

He explained that small- or medium-size companies find unit record installations "the best answer to the costliness and inefficiency of manual bookkeeping and accounting methods. When a small- or medium-size business . . . expands, usually processing expenses increase in direct proportion to the expansion.

"However, a company employing a unit record system with maximum controls and optimum programming can expand with a relatively small increase in processing costs, thus increasing the margin of profit."

Full System for 50%

One of the support companies, Dynax Resources Inc., advertises a "full-speed system for 50%" of the cost of purchase from IBM.

Robert Stevenson, president of the New York firm, explained the marketing concept this way: "A really small businessman can't afford System/3. Instead of selling to his future needs, I prefer to sell to his present needs, giving him the upgrade when he needs it."

Stevenson indicated IBM does not recognize the existence of a market for used unit record equipment. "They don't recognize used prices, which keeps our market open," he said.

Dynax also markets itself as a service bureau, leasing company, and "one day, maybe" a timesharing outfit.

As people grow through unit record, Stevenson said, they may graduate to the mini, then, "maybe a few years down the road, we may put together some sort of computer utility, and tie in the minis through some kind of telephone lines."

Dynax is said to be working on a minicomputer of its own, and also has exclusive marketing rights to Timesharing Systems Inc. in the New York area.

Training, Too

All this, of course, is in addition to training. Stevenson feels that, if a DP manager is "any good at all, he works with computers."

These companies remove the recruiting problem by training individuals. Dynax, for example, "sells" a complete unit record package, including training, and a year's guarantee for parts and labor, for about $600/mo.

Stevenson said that his way is "risk-free," since the user can have a full trial run on company (Dynax) premises before committing any money.

Other systems companies for unit record installations, according to Schwalm, provide the "talent required to design and implement a complete, optimum system which will perform a full range of bookkeeping and accounting functions."

Some of these companies will market minicomputers or service bureau facilities, if the occasion arises. But, if they follow their original philosophy, they will also continue to provide training and maintenance for all their customers, at a predetermined, agreed price, contingent upon hardware considerations.

Computer at the gambling casino tabulates profits and losses.

Computer Controls Casino Transactions, Cash Flow

By Harvey Elman
CW Staff Writer

WASHINGTON, D.C. – The gambling casino has entered the computer age. A recently patented cash flow computer system controls all of the cash, chips, and credit transactions that occur in a casino.

Robert Howard, president of Centronics Data Computer Corp., Flushing, N.Y., and Dr. An Wang, president of Wang Laboratories Inc., Tewksbury, Mass., have been issued patent No. 3,516,068 for their joint invention of this general on-line, real-time system, developed for gaming casinos as its first application.

The Centronics Casino System requires that individual transactions involving the sale of chips, the cashing-in of chips, the transfer of chips, the issuance of credit, the payment of credit and the receipt of checks be entered into the computer through either a table keyboard at each gaming table, a cashier's keyboard, or an accounting keyboard. A croupier inserts his identification card and punches in the details of a transaction.

The computer controls all of the transactions, placing the data into core memory and generating the necessary paperwork, vouchers, or transaction listings. No cash, markers, or chips can change hands until the computer generates the paperwork, which is said to take less than two seconds.

A tape shows the nature and amount of each transaction, the table number, and dealer's identity. The cashier is kept informed of players' signatures required and whether to send cash or a credit slip to the table involved.

At the end of a shift, and at the end of the day, the casino management gets a statistical summary of profits and losses. At any time during the play, the computer can report the current win or loss of the casino in dollars.

The system is not yet in use in Las Vegas or elsewhere in the U.S. However, the system is currently in operation in many of the largest casinos in the Caribean area.

This patent has been assigned to Centronics by the two creators. Centronics has issued the license to Wang Laboratories for the use of this patent for applications other than the gambling casino industry.

Fujitsu Ltd. First Japanese Firm To Install Full-Scale Unit in U.S.

NEW YORK – While analysts, industry specialists, and the trade press have long speculated on the Japanese entry into the U.S. mini market, one company is installing the first full-scale Japanese system sold in this country.

The Fujitsu Ltd. Facom 230-25 is being installed in the Manhattan offices of ASI Computers, a division of Automation Sciences Inc., a New Jersey-based computer service company. ASI will sell and service the system in the U.S.

Introduced in 1968, the Facom 230-25 offers high processing speeds through use of fast access systems drums at prices reportedly below those of comparable U.S. systems.

Fujitsu Ltd., a Tokyo-based computer and peripheral manfacturer, is currently using the special computer facilities built by Computer Preparations Inc.

ASI reports that the Facom system has penetrated areas served by large IBM 1130 configurations, IBM 360/30s, Honeywell 200s, RCA Spectra 70/35s, Univac 92/9300s, and comparable models.

DP Knowledge Seen Vital To Careers in Marketing

By Harvey Elman
CW Staff Writer

DENTON, Texas – "In March of 1951, the data processing industry had one installation and a government survey indicated that six more computers would satisfy the requirements for the entire U.S. This survey must rank with Russia's evaluation of the worth of Alaska."

This observation by Dennis Reardon, branch manager for Honeywell, Dallas, was made at the recent marketing conference on "Computer Application in Marketing" in the North Texas State University school of business administration.

In his discussion of "Marketing and the Computer," Reardon said: "Today there are an estimated 57,000 computer systems in 45,000 organizations, with an installed value of approximately $20 billion."

100,000 Systems

The Honeywell manager predicted that in the 1970s over 100,000 systems will be installed and, by the year 2000, more than 220,000 total systems will be in use.

Noting that "in some cases, the need is not there but the computer is," he emphasized the necessity to evaluate the computer like any other tool. "If you can benefit from one, you should have one."

Reardon considers one of the greatest problems facing executive management today to be "their lack of understanding of the computer: how to control it and their role in the managing of the computer installation from the executive level . . . . They now find themselves with a million dollar piece of equipment on the premises and are not sure how to use it effectively."

Can Opener

Robert W. Bechtel, vice-president, Dun & Bradstreet Inc., New York, in discussing the "Computer as a Can Opener," noted it is "impossible for business to operate independent from government and even less possible for it to exist independently of its surroundings."

The computer therefore serves to analyze all the knowledge that is available to marketing specialists. "Into the cans go data, out of the cans come information," Bechtel added.

Reardon said: "The exposure of business school students to the computer is constantly increasing and, as this exposure expands, much of black box mystique will disappear. Tomorrow's marketing executive will be a knowledgeable user of the computer because he was brought up on this approach."

He added that half of the computer problems encountered by marketers are created by a breakdown in communications "early in the game" between management and the computer specialists.

Electronic Heart Doctor

MADISON, Wis. – The University of Wisconsin Medical School has developed a computer program that can analyze electrocardiograms to diagnose heart ailments.

24 Manufacturers to Join in Trade Center Dedication

SYDNEY, Australia – Twenty-four manufacturers from 15 states will join in dedicating America's first permanent export promotion facility in the South Pacific when the U.S. Department of Commerce opens its eighth and newest U.S. Trade Center here June 29.

The showroom will open with a five-day presentation of the latest in U.S. computer peripheral equipment and communications systems. Audiences will be limited to 200 to permit effective audience/author interaction.

Cosponsors of the symposium will be the Association for Computing Machinery (ACM), reportedly signifying the first time that any U.S. Government agency has cosponsored a program of this type with any association or society.

"The Sydney Center is a logical expansion of the department's export promotion activities. It will provide U.S. manufacturers a focal point for displaying the results of the latest research and development in their industry to Australian customers. At the same time it will give them an opportunity to learn about additional Australian needs and expose them to special areas of Australian expertise," said Kenneth N. Davis Jr., assistant secretary of commerce for domestic and international business.

Technical Symposium

The first exhibition, June 29-July 3, will feature data communications and graphic data systems. A technical symposium, "Computers for the Seventies," will be held in conjunction with the exhibition.

The U.S. share of the Australian import market has been rising steadily since 1960. Austalia's total imports in 1968 were valued at nearly $4 billion. The U.S. share of the market was $1.2 billion, or 26.4%, up from 16% in 1960. The U.S. replaced the UK as Australia's chief supplier in 1967.

Exhibitions, whenever possible, will be accompanied by technical conferences, colloqiums, and seminars. Plans call for shows and seminars to be scheduled on a recurrent, periodic basis, with each show concentrated on a single aspect of Australian industry's needs.

Lesser Degree

The other seven U.S. Trade Centers in Bangkok, Frankfurt, London, Milan, Paris, Stockholm, and Tokyo were directed toward the identification and promotion of marketing opportunities substantially capable of development by the introduction of new American exporters to the markets served by these centers.

This will be the case to a lesser degree at Sydney, where the activities of the center will be largely devoted to the Australian market.

Walter J. Kosinski, a private consultant in computer design and use, and chairman of the ACM Special Interest Group on Communications (Sigcom), will be symposium chairman and will also lead a discussion on data communications computer process design.

John M. Bennett, professor of physics (computer science) and pro-dean of the Faculty of Science, University of Sydney, and an expert on computer graphics, will deliver the keynote address.

GE Direct Data Entry System Can Handle 180,000 Tax Returns

OGDEN, Utah – The third and largest of seven GE computer-controlled Direct Data Entry systems (Ddes) designed for the Internal Revenue Service is currently at work processing 1969 income tax returns here at the Western Service Center.

According to Robert Terry, service center director, the GE system handles an "estimated 180,000 returns passing through the system daily during peak periods."

The Ddes contains 560 Datanet-760 terminals – 175 more than centers using similar Ddes systems in Chamblee, Ga. and Austin, Texas.

Ddes enables IRS to take data from tax returns and place it on magnetic tape, bypassing the previous intermediate step of keypunching the information on cards. Errors made in transcription under the new system can be corrected immediately, thereby reducing the verification costs and simplifying error resolution.

The Western Service Center is responsible for tax returns from Montana, Idaho, Washington, Oregon, California, Nevada, Utah, Arizona, Alaska, and Hawaii. The GE systems are scheduled for installation in Philadelphia (Mid-Atlantic), Covington, Ky. (Central), Kansas City, Mo. (Midwest), and Andover, Mass. (North Atlantic).

IRS estimates that after all seven existing IRS service centers have Direct Data Entry systems installed and operating, the punching and processing of some 400 million cards a year will be eliminated. Additionally, reduction in key verification and error resolution requirements should produce savings of several million dollars annually for IRS.

The Ogden installation includes two GE GE/PAC-4020 process computers, two disk storage controllers, six DSU-160 disk storage units, tape controller, four tape handlers, and 560 key station terminals.

UAL to Buy 3 Univac 1108s From Sperry Rand Corp.

CHICAGO – United Air Lines (UAL) and the Univac Division of Sperry Rand Corp. have agreed to allow United to purchase three Univac 1108s, including peripheral and remote devices.

The equipment will be utilized for a variety of applications including message switching, material control, flight information, and flight planning.

The agreement, which includes amicable settlement of the previous Unimatic contract involves retention of a major portion of the Univac equipment and will provide UAL with possibilities for future expansion of the systems.

UAL recently announced a contract for some $50 million of IBM equipment and technical services for a computerized passenger reservations system, cancelling a previous Univac pact for an undelivered system due to be operational by June, 1968 [CW, June 3].

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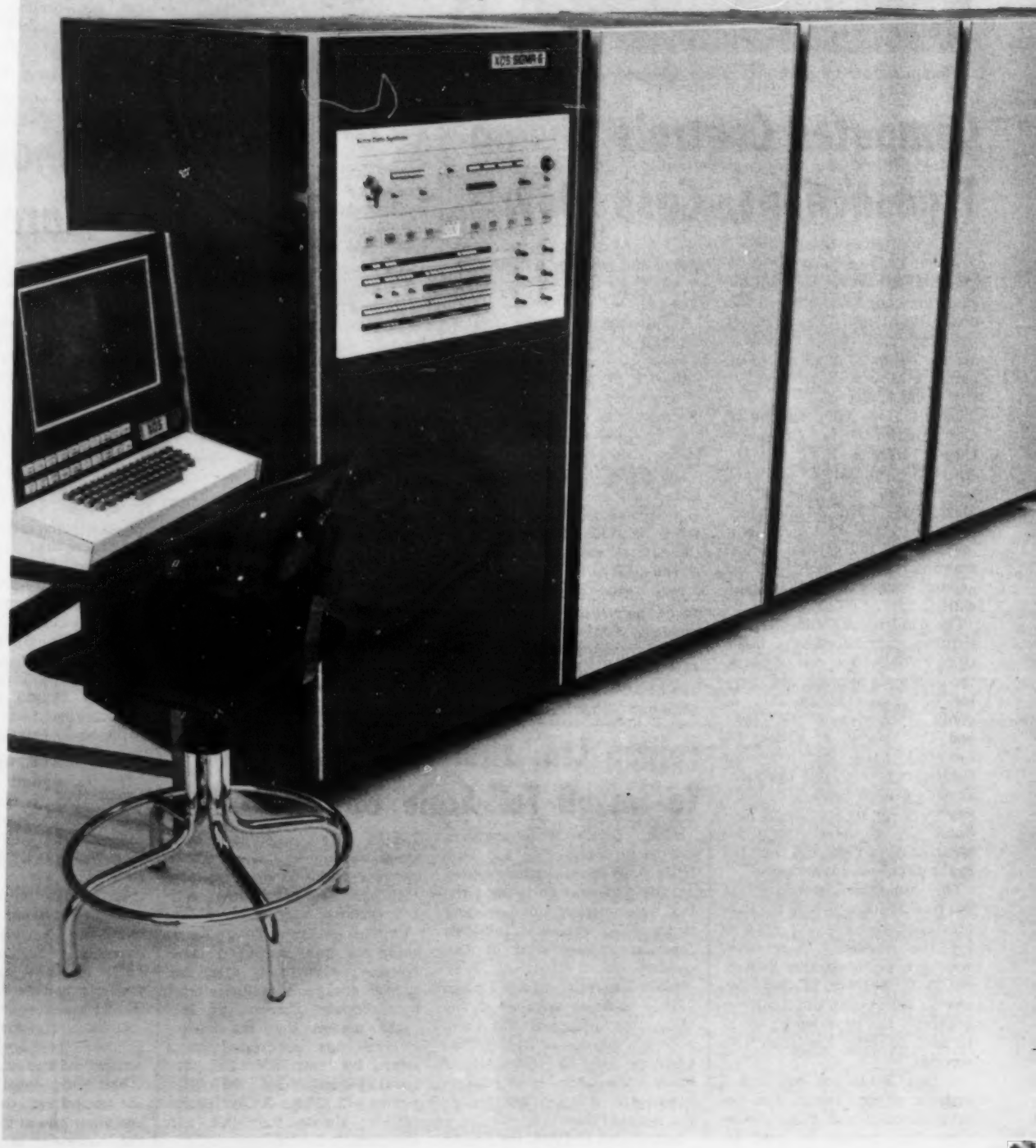


50 Cent Public Computer

'Store' Sells Time-Sharing , Supplies to Individuals

By Anne Nolan
CW Staff Writer

MONROEVILLE, Pa. – A new idea, the brainchild of two Pittsburgh businessmen, has resulted in making computers available to the general public at "reasonable" prices.

To implement this idea, Fasturn, Inc. was formed in December by David Nickerson, chairman of the board, and Herman W. Millsteine, president. Nickerson, with a technical background, has worked as director of the computer center at Carnegie-Mellon University; Millsteine, with a sales background, has been associated with RCA and Honeywell.

According to Nickerson, the Fasturn "store" is essentially a way of making computing services available in small amounts. Not only does the store sell time-sharing services but supplies as well. A person can just walk in and buy magnetic tape, for instance, in whatever quantity he wants. As Nickerson stated, "The store collects these small users and represents them and makes their wants available on a walk-in basis."

He said time can be rented on the computer for as little as 50 cents. Asked what you would get for 50 cents, he replied that you could get information about a stock. "Further," he said, "take, for example, $4. This would buy what we call a 'fast turn.' It buys you three seconds of CPU time and some input/output lines. Then you pay additional amounts as you go above this basic minimum. It amounts to roughly a penny a line in and out, and then a charge per CPU second.

"For the time-sharing terminals, we charge a nickel a minute and a nickel an inch of paper that is used. It comes out to about $8 an hour. This is little more than an hour of bowling would cost."

The computer to which the terminals have access are a small Hewlett-Packard system in Greentree, Pa., and a CDC 6600 in Minneapolis.

Asked what gave him the idea of going into this business, Nickerson replied: "When I was director of the computing center at Carnegie-Mellon University for five years, I noticed that typical debugging activities were costing 8 to 10 cents in resources. It occurred to me that something in the price range of a hamburger was selling in the price range of a locomotive."

He said that computing services currently are sold in large lots while a smaller piece of it is quite inexpensive. His idea to get a better mechanism resulted in a retail "store."

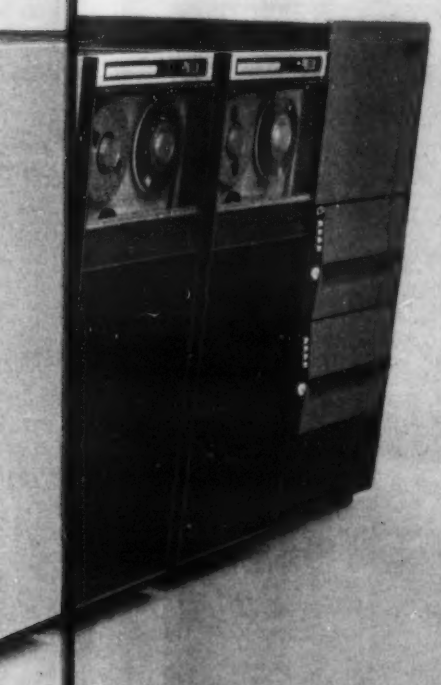
"I think that up to now data processing has been largely like a tailoring business – a custom sort of solution for each problem. You pay a rather high price for it," he said.

Businessmen can purchase software programs that will run off their payroll or keep track of their inventories. Scientists can buy time to solve problems. Housewives may get menu planning advice or learn to play bridge.

Selling time on a computer is not new but, according to Nickerson, making computer terminals available to the public is. He feels that the small user simply has had no service at all. He also feels that there has been no adequate market at the current time for software packages. His firm has agreements with almost 100 software manufacturers to represent them in the Pittsburgh area.

Nickerson said the Fasturn idea is a "good, better, or best sort of thing. In other words, we will have three kinds of tapes, three kinds of disk packs, and so forth."

a business machine.



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Barclays, ICL Form Baric Service Bureau

By J.H. Bonnett
Special to Computerworld

LONDON – A large European computer service bureau recently went into operation in the UK under the name of Baric Computing Services Ltd. It is an amalgamation of ICL's Bureau Services Division, International Computing Services Ltd. (ICSL), and the Customer Services Division of Barclays Bank Ltd.

The new company has an issued share capital of $2.4 million split 40/60 between Barclays and ICL. Barclays has also put $3.6 million into the venture.

The services of the managers of Barclays Bank's 3,300 branches are being enlisted to promote the activities of the new company which will be primarily aimed at commercial and financial services. This is designed to attract many customers from the small- to medium-size firms not currently using computer services.

Services will in no way be dependent on clients being customers of Barclays, but the existence of Baric will no doubt provide some leverage for the bank in gaining new accounts.

Baric starts with an annual turnover in excess of $7.2 million and 2,000 customers inherited from ICSL. This amounts to about 15% of the current UK bureau market which is expanding by 30% annually.

The company has a total staff of over 1,000 of which at least 25% are professionally qualified, with 10 processing centers throughout the UK and Ireland using 16 ICL computers. Baric claims to process the salaries of 1% of the working population of the UK and its clients include such firms as Marks and Spencers, and Wedgwood. Future plans include a multi-access service based on an ICL System 4-75, due to be demonstrated in the next few weeks.

Barclays Bank itself has nearly 20 IBM computers which it will continue to use for its own services.

The new company falls into line with two current trends: the growth of large service bureau companies, and a move by the banks into the operation of computer services. The National-Westminster Group offers a wide variety of services under its own name, and both Lloyds and the Midland Bank have invested heavily in Systems International.

Contracts

Computer Sciences Corp. has been awarded a contract to perform scientific and analytical studies for the headquarters of the U.S. Army Combat Developments Command at Fort Leavenworth, Kan., and to provide technical support to the command's war gaming facilities, which include simulation, modeling, computer-assisted map analysis, cost effectiveness analysis, and operations research techniques.

Gap Instrument Corp., Hauppauge, Long Island, N.Y., has been awarded contracts by the Arma Division of Ambac Industries, Inc. for the design and production of digital computer interface units and power supplies. They are for use in Arma's area navigation systems for the Lockheed L1011 Tristar commercial jet transports and other wide-body airline jets. The computer interface units link the area navigation system's computer to the other associated systems in the aircraft. Terms of the agreement were not disclosed.

Datamac, Inc., a wholly owned subsidiary of University Computing Co., has received a five-year facilities management contract from Western Farmers Association (WFA). Datamac will assume total responsibility for WFA's data processing operation in Seattle. Terms of the contract were not disclosed.

Clary Corp.'s Precision Instruments Division has received a contract valued at more than $200,000 from IMC for digital printers to be used in a retail point of sale data system known as Registron. The system, developed and marketed by IMC, is designed primarily for department stores.

Ampex Corp. has received a contract for about $200,000 from Systems Engineering Laboratories for core memory stacks. The stacks will be used in Systems' 810B real-time computer systems.

Information and Communication Applications, Inc., Silver Spring, Md., has been contracted by the Post Office Department to implement a vehicle accident statistic system. The system will produce information indicating not only safety deficiencies, but all other causes which contribute to motor vehicle accidents in the postal fleet. Terms were not disclosed.

InfoMed, Princeton, N.J., has been retained by St. Peter's General Hospital, New Brunswick, N.J., to establish a complete financial data processing system in the hospital. Terms of the contract were not disclosed.

Burroughs to Purchase Bull-GE Peripheral Units

NEW YORK – Burroughs Corp. will purchase $10.5 million worth of computer peripheral equipment from Bull-General Electric over the next three years.

S.G. Jerritts, general manager of the B-GE's input/output equipment department, said contracts were in addition to an earlier $10 million order for keypunch units.

Involved in the follow-on contracts are more than $9 million worth of P-112 keypunches and about $1.5 million of V-126 verifiers, including spare parts for both.

A spokesman for Burroughs said the additional orders were due in large part to high customer acceptance of the B-GE keypunch units connected to terminal computers, as well as keypunches and verifiers supplied with other Burroughs data processing equipment.

About 90% of the peripheral units and related spare parts, manufactured in the B-GE plant in Belfort, France, are scheduled for export to the U.S. and to other countries in Europe and other parts of the world.

Jobs by Computer

PITTSBURGH, Pa. – A computerized job bank provides a listing of about 3,000 job openings in the Allegheny County area.

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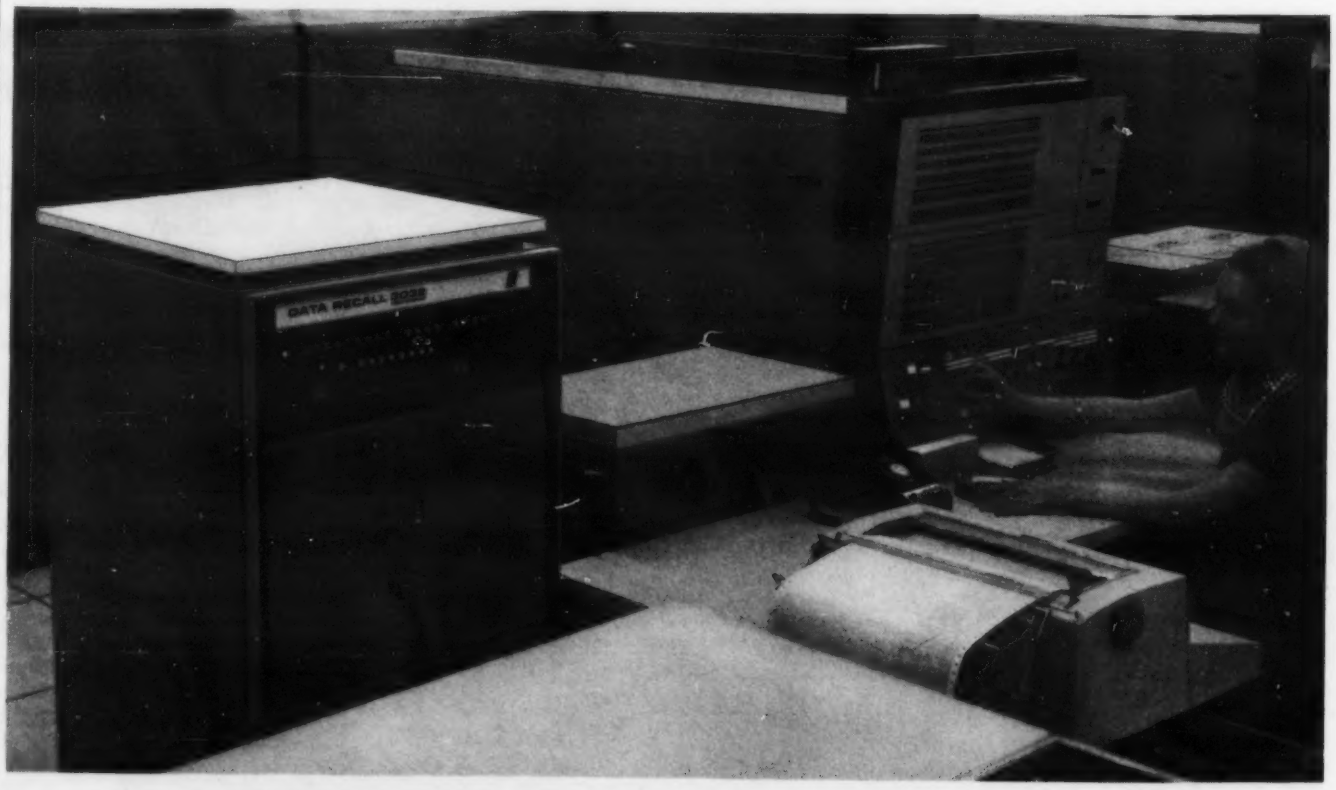

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Century Data Adds to Anaheim Facility

ANAHEIM, Calif. – In its second expansion of 1970, Century Data Systems has added another 20,000 sq ft to its Anaheim, Calif., facility. Century Data, manufacturer of disk memory drives and controllers, expanded in April to house its engineering and marketing groups.

The new addition, which brings total plant area to more than 62,000 sq ft, will accommodate Century's manufacturing support operations.

A futher expansion, scheduled for late 1970, will bring the total plant area to more than 100,000 sq ft.

Century Data Systems, formed in 1968, is affiliated with California Computer Products, a supplier of computer graphics output equipment.

Other Expansions

Data-Link of San Mateo, Calif., has constructed an additional 33,000 sq ft plant facilities and administrative office in San Diego. Data-Link presently has manufacturing operations in Detroit and distributes its products throughout the U.S. and seven foreign countries.

Comcet, Rockville, Md., producer of computer communications systems, has opened three additional field marketing offices in Philadelphia, Pittsburgh, and Detroit. The Philadelphia office is managed by Walter Berger and operates as a branch in the eastern marketing region headquartered in New York City. The Pittsburgh branch, assigned to the Comcet Washington regional office, is located at One Oliver Plaza, Suite 726.

Communications Logic, Inc. of Houston is expanding its sales and marketing efforts in the western U.S., opening an office

Expansions

in Orange, Calif., at 501 North Bank Tower in Union Bank Sq. Communications Logic designs and manufactures computer communications and telecommunications equipment. Headquarters and plant are located in Houston at 6400 Westpark Dr.

Westinghouse Electric Corp. is doubling the size of its Hagan/Computer Systems Division plant in O'Hara Township. The addition to the plant will have 125,000 sq ft of space devoted to office, manufacturing and systems development activities.

Westinghouse entered the computerized process control field in 1962 with facilities at the company's research laboratories in Churchill Borough, near Pittsburgh. The Hagan/Computer Systems Division includes Hagan Controls, which specializes in instrumentation and analog control, and the computer systems activity, which produces digital controls.

The Hagan/Computer Systems Division produces process control computers; electronic control components; and systems engineering and programming for both analog and digital control systems. The products are used in applications ranging from steel mill control to water purification.

IBM's Canadian subsidiary announced it will build a 200,000 sq ft plant in Bromont, Quebec, for the production of electronic circuits for computers.

'Slittering Tape'

In a dust-free environment at RCA's magnetic products plant in Indianapolis, technician Kay Duncan checks a machine that slits sheets of coated polyester film into half-in. strips of magnetic tape used by computers. From the slitting operation the tape goes right onto reels, each of which holds 2,400 ft of tape and is capable of storing more than 46 million bits of information.

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Airline 'Self Service' Reservation System Foreseen

BLUE BELL, Pa. – Computerized airline information systems are expected to become more comprehensive and efficient in the coming decade than ever before.

To accomplish this, airlines will double their computer investments in the next five years and perhaps triple them within the decade, according to E.C. Schwanke, national manager for Airline Marketing for Univac Division of Sperry Rand.

Major airlines are now using computers for reservations, inventory, passenger name records, flight operations, accounting, and communications.

"But within five years, self-service may be an established part of the airline industry," Schwanke said.

Such systems could confirm reservations, control transportation to and from terminals, order food, issue tickets, route baggage, admit the passenger to the plane, perform all the billing, and many other details, he said.

Schwanke illustrated the way such a system would work:

The passenger may use his Touch-Tone telephone to request information on his flight, for instance, and will communicate only with a talking computer.

When he has selected his flight, the passenger may again use his phone to request a seat, specifying flight number, class of service, departure city, destination, and travel date. The computer can immediately tell him if his seat is confirmed.

Then, a computer-controlled monorail may take him from the city to the airport. Near the entrance to the terminal he will insert his airline credit card into a passenger check-in device linked to a remote computer.

After the computer verifies that the card is not lost or stolen, the passenger will push several buttons to receive his ticket and baggage tags.

He will then move to a boarding area on a monorail or moving walkway, where he will insert his ticket into a slot and board the plane.

All this will take place under the watchful eye of the computer, Schwanke said, and will help to ease crowded conditions at airports as air travel continues to boom and bigger and faster super-jets enter service.

Passenger Processing System

Univac, in conjunction with the airlines, is already developing automated or semi-automated passenger processing systems, according to Schwanke. These would include automated devices to verify credit cards, print tickets and boarding passes, and admit passengers to planes, he said.

Credit cards and tickets or boarding passes would carry magnetically stored information which could be read by special sensor equipment attached to computers, Schwanke added.

This equipment could obtain, directly from information on a credit card, all facts necessary for reservations and billing. Similar automatic gear at the gate – where the biggest passenger bottlenecks occur – would quickly read data on tickets or boarding passes, he said.

The credit card and ticketing devices could be placed at many remote locations outside the terminal, he said. A passenger could pick up his ticket for instance, at travel agencies, hotels, or even the airport parking lot.

This would mean that many people could bypass potentially crowded areas, Schwanke added.

Macy's Expands Use of Terminal Network System

NEW YORK – Macy's will soon have what is reportedly the largest on-line computer terminal network in the retail industry.

The chain recently confirmed that it had signed a contract with Credit Systems, Inc., Colmar, Pa., to expand computer credit authorization equipment to all branches in Macy's New York territory.

Involved are 13 branches on Long Island, upstate New York, Connecticut, Manhattan, Westchester, and Brooklyn. A fourteenth branch under construction, Kings Plaza in Brooklyn, will also be included in the system by opening day.

When the expansion of the system is completed in October of this year, Macy's will have a total of 1,754 terminals on-line to a single central processor.

The central data bank in Macy's system is in the Herald Sq. headquarters. In actual operation, the CPU will approve or disapprove 20 credit verifications per second.

For Macy's, the new system is expected to reduce even further the number of credit authorizers needed to maintain efficient operations.

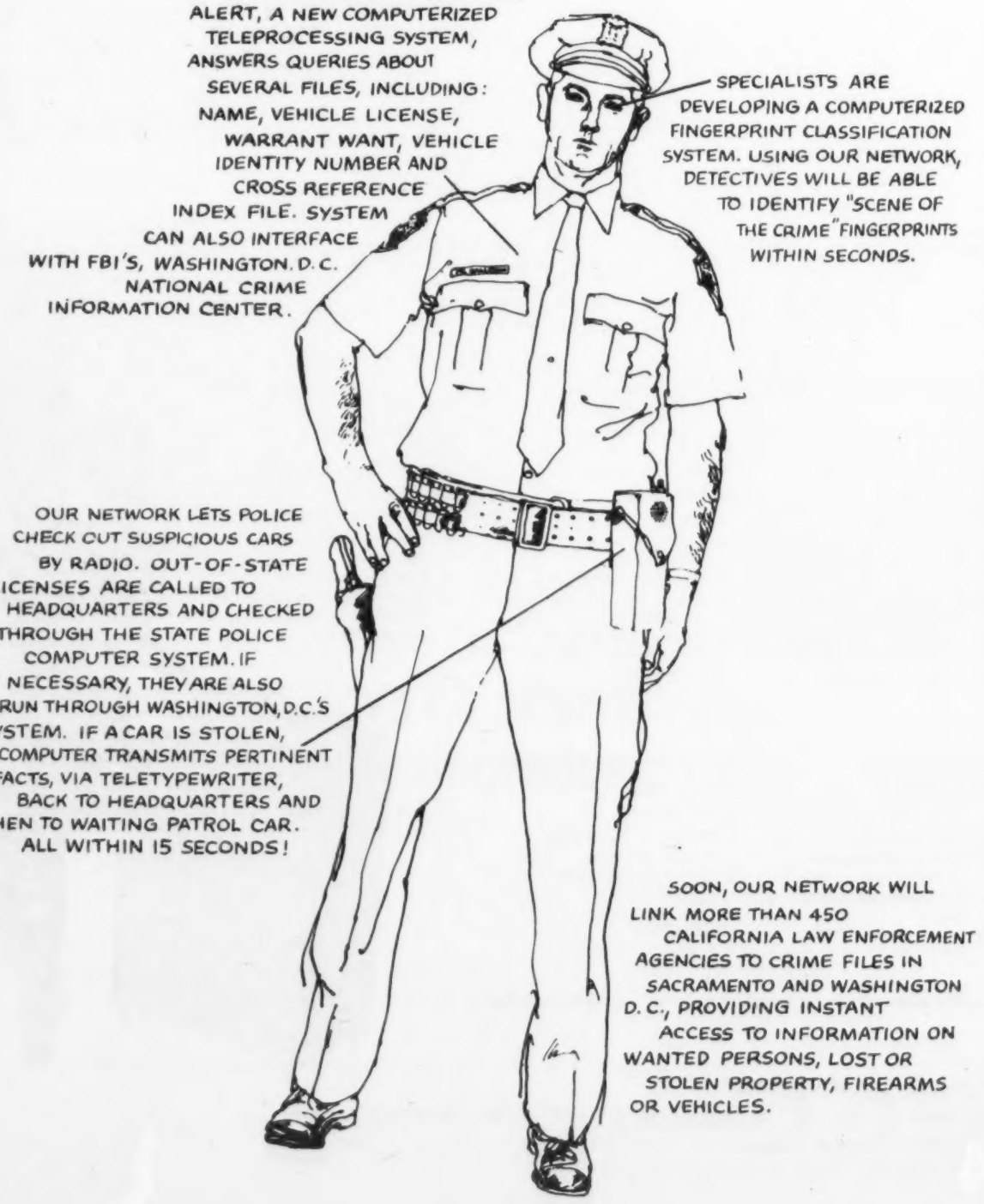
Credit-Chek terminals will be installed at almost every cash register location in each branch, according to Charles Fries, Credit Systems vice-president, marketing.

Counter top units have manual indexing of account numbers. In a typical transaction, the salesperson places both the credit card and the sales slip into the counter unit. The account number is then indexed, and the slip is imprinted if credit is approved.

If credit is not approved (indicated by a red light on the terminal) the salesperson telephones the credit authorizer who indexes the account number into Credit Systems' authorizer unit.

Authorizer personnel then instruct the salesperson to either hold the card or request that the customer go to the credit department. But authorizer personnel also have the option to give single purchase approval – simply by depressing a code key on the authorizer unit.

Another key feature of the Credit Systems' equipment is its ability to prevent transactions involving lost or stolen credit cards. Macy's will now update the memory bank daily by magnetic tape, entering account numbers of cards reported stolen or lost.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Here's a Billboard Message for the Decision Makers

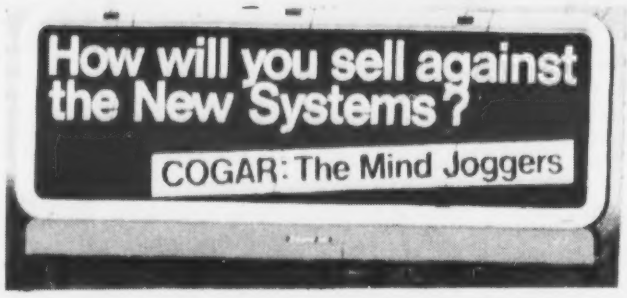
By Harvey Elman
CW Staff Writer

WAPPINGERS FALLS, N.Y. – "This was strictly a 'rifle shot' promotion, aimed at one key guy in each company. He's the only one we wanted to reach. And we're convinced that the media dramatized the message."

Norb Andres, marketing manager for Cogar Corp., a manufacturer of semiconductor computer memory systems, was describing his company's recent month-long billboard advertising campaign.

The message on highway billboards throughout the country read, "How Will You Sell Against the New [Computer] Systems?"

Cogar intended to focus attention on a new memory technology that will enable the selected target manufacturers to maintain a competitive cost/performance balance with others in the industry. "The idea was to hit the guys over the head and move up their time schedules considerably," noted company President George Cogar. The campaign's success, however, was clearly a gamble.



Sign on Route 128, Wellesley Hills, Mass., was directed at top management from Honeywell, DEC, Sylvania, RCA, and Data General along "Research Row." The label, "Cogar: The Mind Joggers," was added shortly after the original sign was displayed.

The strategy was to catch the eye – to or from work or between plants – of decision-making executives in every U.S. company that might become a highly profitable customer. These included OEM suppliers such as Burroughs, NCR, Control Data, RCA, Univac, GE, and Honeywell.

One Cogar competitor seemed amused by the promotion. Arthur Mones, vice-president for technology of Semiconductor Electronic Memories Inc., said: "I think the idea was a little ludicrous. These key decision makers are not going to find out about Cogar from billboards."

To make sure that decision makers at least knew what the campaign was about, Cogar sent them black boxes personalized with their own names in silk-screened lettering. Inside was a miniature pop-up billboard complete with fake grass setting and a car on the road, plus a promotional flier.

"On the concept of the campaign, it's not an ice-breaker," noted a spokesman for Davi-Callihan Inc., a New York ad agency which created the idea. "In every case, Cogar has had discussion with the companies involved. The mission was to dramatize the message, to add some 'clout' to the existing communications program. We believe billboards are an overlooked medium in industrial type advertising, especially when it comes to reaching only a handful of individuals." The waste circulation, however, was admittedly "fantastic."

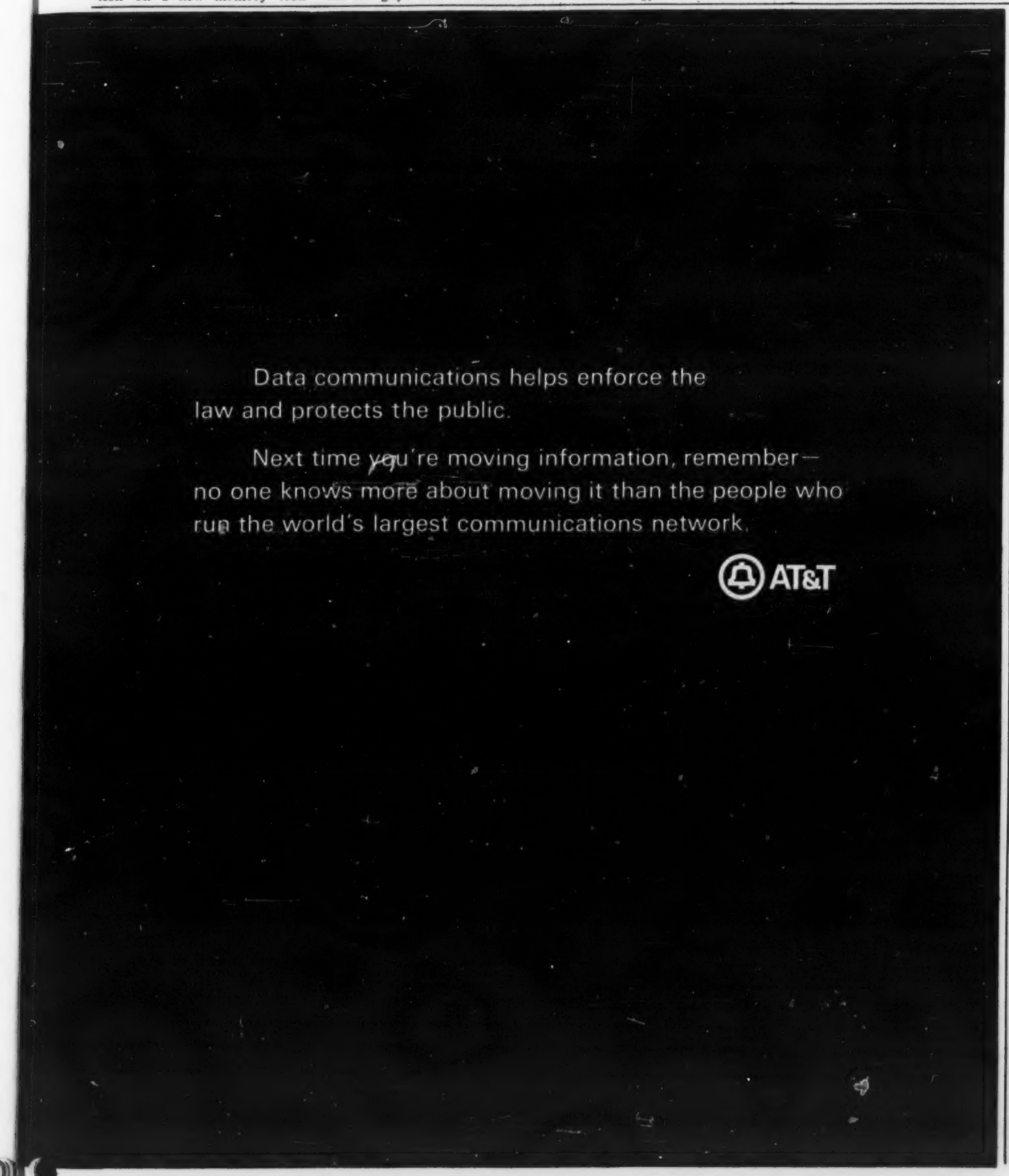
Said Andres: "I think that computer people will take more notice of billboards as a result of publicity utilizing this new technique as well as the impetus of our campaign. It seems to be an economical approach to reach the top management personnel by locating signs near to their normal travel between home and plant as well as between plants." The billboard campaign cost approximately $5,000 of the $22,000 spent for the total campaign.

Effective Medium?

Can a typically mass audience medium be used effectively in selling a few decision makers?

An informal CW survey of a few selected target decision makers indicated that the promotion was not as effective as anticipated. "Most of the decision makers in this company don't even drive to work in the same direction as the sign is located," said one. "Billboards won't influence any decisions, nor make me want to learn more about the system," seemed to be the general consensus.

"Not only have I not noticed the sign," said one of the target executives, "no one has even called it to my attention." Still, he is intrigued. "It has some elements of the Volkswagen and Avis approaches."


Data communications helps enforce the law and protects the public.
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Trade Shorts

Bulgaria has established a state organization, Izot, to import and sell computers. Officials said it would also take charge of the design and manufacture of computers and automated control systems.

Daedalus Computer Products Inc., N. Syracuse, N.Y., a manufacturer of programmable data terminals and peripheral devices, has opened sales offices in New York City, Washington, D.C, and Boston.

Wang Computer Products, Inc., Los Angeles, has announced it will offer full field service capability for all of its products in 17 major U.S. cities.

Vermont Research Corp., North Springfield, Vt., has lowered its systems prices, extended its discount schedule, and reduced the price of its small mass storage drum memory Model 1004 by 10%.

GE Installs First of Two 635s For the Air Force in Pentagon

WASHINGTON, D.C. – The first of two large-scale GE-635 information systems ordered by the U.S. Air Force data services center recently was installed in the Pentagon.

The U.S. Air Force signed a $12.2 million contract last year for two, dual GE-635 information systems and five small-scale GE-115 systems. The GE-115s are scheduled to be installed this fall while the second dual GE-635 is scheduled for installation in early 1971.

Four of the GE-115s will be located in the Pentagon and the fifth will be installed at the Air Force's assistant chief of staff studies and analysis office in Rosslyn, Va.

All five will provide remote access to the GE-635s at the data services center.

The GE-635 will perform in three dimensions of data processing, batch, remote batch, and time-sharing, concurrently and against a common data base.

The data services center functionsas a service organization for the Air Force, performing personnel record, payroll, and inventory control applications, as well as conducting scientific research, statistical analysis, and war games.

The newly installed dual GE-635 includes a 192,000-word memory, 28 magnetic tape handlers, 18 DSU-270 removable disk storage units, three high-speed printers, two card punches, card reader, and a Datanet 30 communications processor.

Chess Anyone?

SALT LAKE CITY, Utah – Robert Graves, high school senior and avid chess player, set up a match with a computer. When asked the outcome, he replied: "The computer lucked out."

Orders and Installations

The U.S. Air Force has ordered a dual GE-600 information system to be installed at Wright-Patterson AFB in Dayton, Ohio. The proposed GE-600 complex, Computational Resources for Engineering and Simulation Training and Education (Create), will link Air Force bases across the nation to the central computer center at Wright-Patterson.

Ampex Corp., Culver City, Calif., has begun delivery of Model TMZ digital tape memory systems to Data Pathing, Inc., (DPI), Sunnyvale, Calif., under a contract for about $350,000. The compact, computer-class TMZ is incorporated in a new DPI system designed for a wide range of industrial data-collection uses.

Singer-Librascope, Glendale, Calif., has received an order for 500 L107 mini-memories from Inventory Management Systems of Los Angeles. The L107 is a self-contained, plug-in read/write magnetic disk memory of 512,000 bits, designed for applications requiring high-speed, low-cost data storage. The memory will be used with a computerized checkout and inventory system for supermarkets [CW, March 18].

A Burroughs B2500 data processing system valued at $600,000 has been installed in Diversified Computer Applications, a Palo Alto, Calif., service center.

Washington Medical Data Center has arranged with Mosler Information Systems of Hamilton, Ohio, to install a Mosler 410 model, a high-speed microfilmed information storage and retrieval system. The equipment will be linked to the center's IBM 360.

Ten of Multidata's Model A computer systems have been ordered by Electronic Stock Evaluator Corp., located in Westminister, Calif. Multidata's Model A costs $15,000.

Zero-Max Industries, Minneapolis, a small manufacturer of speed control devices and office furniture, has installed an IBM System/3 in its offices. Sutliff Chevrolet of Harrisburg, Pa., has also installed a System/3.

Southern California First National Bank has received an order for its Management Information System (Mis) from Northwest Bancorp., Minneapolis, and from First National Bank of Louisville.

Several new orders have been received for Univac's 9000 series computers. Federal Screw Works has ordered a Univac 9400 for on-line communications to develop a corporate management information system. Schuyler Manufacturing Co., Mechanicville, N.Y., Colonie Central Schools, Albany, N.Y., Comet Rice Mills Inc., Houston, and National Bank of Detroit, have installed Univac 9300 computers. 9200-IIs have been ordered by Anaconda American Brass Co., Buffalo, N.Y., Transportation Institute, Washington, D.C., the city of Oak Park, Mich., and Maryville Utility Board, Maryville, Tenn., Schenectady Chemicals, Inc., Schenectady, N.Y., Nelson A. Taylor Co. Inc., Gloversville, N.Y. Super Toys of Detroit, and Gioia Macaroni Co., Buffalo, N.Y., have ordered Univac 9200 systems.

An order for $200,000 worth of Typeliners has been completed by Data Computing, Inc., Phoenix, Ariz., with Courier Terminal Systems, Inc. The Typeliners will be used to produce hardcopy from selected displays appearing on the Courier CRT display.

CDC Gets Air Force Contract for 6600s

MINNEAPOLIS – Control Data Corp. has been selected to furnish and install two 6600 computer systems, valued at $13 million, for the Air Force Cambridge Research Laboratories, L.G. Hanscom Field, Bedford, Mass.

The Control Data equipment will be used to provide a centralized data processing service for the acquisition, requisition, reduction, and analysis of laboratory data in the conduct of research and exploratory development programs in the environmental and physical sciences.

The CDC dual 660 system includes remote batch input/output terminals, individual keyboard terminals, and interactive graphic CRT terminals.

The equipment will be housed in a newly constructed computer center building and will be phased in over the life of the system according to the laboratories' workload.

Control Data was selected by the Electronic Systems Division's directorate of automatic data processing equipment selection. Acquisition of the equipment will be through an Air Force contract.

Here's a remote batch data terminal with no "buts" about it. It's the DTS-100—a complete, programmable data processing system. It's designed for ready access to any large computer, no matter how far away. It transmits data at 2000 bps to 9600 bps. It reads up to 600 cards per minute. It prints up to 1000 lines per minute. In full or half duplex modes. Over common carrier or private lines. Dial-up or dedicated.

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Appointment of 3 Vice-Presidents Announced at Computer Synectics

SANTA CLARA, Calif. – Appointment of three new vice-presidents has been announced by C. Dudley Warner, president of Computer Synectics, Inc., developers and manufacturers of computer monitoring equipment.

David G. Jorgensen has been promoted from vice-president, finance, to executive vice-president. Previously a project manager for Stanford Research Institute, Menlo Park, Calif., and the Boeing Co., Seattle, Wash., Jorgensen holds masters degrees in both business administration and engineering.

Bruce A. Jackson has been promoted from director of manufacturing to vice-president, manufacturing and finance. Jackson formerly was director of corporate planning for the Browning Arms Co. of Morgan, Utah. He holds degrees in electrical engineering and business administration.

Paul E. Haefner has been appointed vice-president, marketing. Before coming to Computer Synectics he was northwest district manager for Computer Usage Co. of San Francisco and Palo Alto, a firm engaged in consulting, systems analysis and design and systems facilities management. He also has held management positions with Great Lakes Computer Center, Inc. and IBM.

Computer Synectics' major product is the System Utilization Monitor (SUM), which measures computer performance as a necessary first step in increasing machine efficiency.

Philip Friend Named a VP at Intranet

LOS ANGELES – Philip A. Friend has been named a vice-president of Intranet Computing Corp. Friend, who joined Intranet in May, 1969, to head the company's equipment development program, was also named director of the Datametrics Engineering Division, a new operating unit. The division incorporates all of the engineering personnel and projects of Intranet and the recently acquired Data Systems Division of Datametrics Corp.

Executive Corner

Before joining Intranet, Friend was associated for three and one half years with Control Data Corp. As director of product management in Control Data's Data Management Systems Division, he was responsible for the general and technical management of programs involving the design and development of large-scale, real-time, and remote terminal computer systems.

At Control Data, Friend also was responsible for products planning and the development of new business prospects.

Earlier, Friend served as a senior systems engineer with Bissett-Berman Corp., Santa Monica, Calif., and as a project systems engineer with the Ramo Wooldridge Division of Thompson Ramo Wooldridge Corp.

Friend was graduated from MIT in 1958 with a B.S. in business administration and electrical engineering. He later received an M.B.A. in finance from the University of Calif., Los Angeles.

■ Philip Breitmeyer has been elected president of Indoness, Inc., Palo Alto, Calif., a Ness Industries subsidiary.

■ Stuart B. Brown has been appointed vice-president of marketing for Information Control Corp., Los Angeles.

■ Marshall E. Greenberg has been named executive vice-president of CRC Computer Radix Corp., New York.

■ William Teefey has been named vice-president of sales for Computer Retrieval Systems, Inc., Bethesda, Md.

■ Dr. Anthony P. Cappelli has recently been appointed president of Universal Analytics, Inc., Los Angeles.

■ Sterling Computer Systems Inc., Houston, has elected Thomas E. Holdswarth as president and chief executive officer.

■ Donald J. Birmingham has been named vice-president of development for Data Pathing, Inc., Sunnyvale, Calif.

■ Richard W. Keogh has been elected vice-president of the Financial Systems Division of Systems and Software Corp., Orlando, Fla.

■ Patrick Dolan has been appointed vice-president of market planning for Itel Corp., Data Processing Division, New York.

■ Herbert B. Blodgett has been promoted to senior vice-president of Boothe Computer Corp., San Francisco, Calif.

Position Announcements

Wyle Labs Elects Wainer President

EL SEGUNDO, Calif. – Stanley A. Wainer has been elected president of Wyle Laboratories. The announcement was made by Frank S. Wyle, formerly president, who was elected chairman and who continues as chief executive officer of the company.

Wainer is a director of Wyle Laboratories and had been executive vice-president since 1968. He joined Wyle Laboratories in June, 1962, as vice-president, finance, and was elected senior vice-president in 1966.

Prior to his association with Wyle, Wainer served as vice-president and secretary-treasurer of Royal Industries, Inc. Previously he had served for five years as director and chief financial officer of four subsidiaries of Paramount Pictures Corp.

A certified public accountant formerly with Price Waterhouse & Co. for five years, Wainer is a member of the American Institute of Certified Public Accountants, the California Society of CPAs, the Financial Executive Institute and Town Hall.

He is a graduate of the University of Calif. at Los Angeles School of Business Administration, and the Graduate School of Business Executive Program.

Wyle Laboratories manufactures machine tools, industrial products, electronic components and computer terminals. The company is also in the fields of electronic component distribution, transportation, and management-oriented investments.

Madden Joins Compata as VP

TARZANA, Calif. – John D. Madden will join Compata on July 1 as vice-president and general manager of the Northern California office, in Palo Alto.

For six years, Madden has been the executive director of the Association for Computing Machinery (ACM).

Prior affiliations include IBM, System Development Corp. (SCD), Rand Corp., and Douglas Aircraft Co. At SDC he held the positions of director of information processing and associate director of research.

Madden received a BA in mathematics from the University of Calif. at Los Angeles.

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W.G.Thompson, Accounting Head, Named UCC VP

DALLAS – W.G. Thompson, controller and chief accounting officer of University Computing Co., has been elected a vice-president of UCC.

Thompson will continue to serve UCC as controller and chief accounting officer, a position he has held since August, 1969.

Prior to joining UCC in 1969, Thompson served 14 years with Continental Oil Co., where he rose to the position of corporate controller.

Thompson, a native of Maryland, received his B.S. degree in business administration from the University of Denver. He is a Certified Public Accountant and has completed post degree studies in management at the Harvard Graduate School of Business Administration.

He is an active member of the Financial Executives Institute and the American Institute of Certified Public Accountants.

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ICL, French Firm Begin Talks on Pooling Resources

PARIS – In a move similar to the Anglo-French cooperation on the Concorde supersonic transport, International Computers Ltd., the dominant British computer manufacturer, and the French state-sponsored Compagnie Internationale pour L' Informatique have begun negotiations on pooling resources in computer technology.

Both the French and British governments reportedly have approved the project.

The object of the plan is to create a European computer capability to compete with U.S. EDP firms, particularly IBM. The American giant accounts for almost one-half of all the computers installed in Europe. Other American manufacturers have supplied an additional 12%. The only country in which IBM is not the sales leader is Britain, where ICL holds a slight edge.

The ICL-CII accord may be a first move toward creating a pan-European computer cartel as other Continental concerns join the pool.

The immediate stimulus for the talks apparently was the decision of GE to combine its computer operations with those of Honeywell. General Electric's Bull-GE subsidiary is the largest native French EDP firm, and a keystone to France's Plan Calcul.

The merger move has renewed criticism of American dominance of European EDP. CII was originally formed as a state holding company to retain some native control over the French computer industry when GE began its takeover of Machines Bull.

The British Government has long advocated a European technological consortium. One of the main purposes of the group would be to foster a competitive European computer industry.

ICL is partially owned by the British Government, which received 10.5% of the firm's stock when the company was formed, in return for financial and technological aid. English Electric Co. and Plessey Co. each own 18% of ICL's outstanding shares.

C&S Scores Record Six-Month Earnings; Canadian Acquisitions Expand DP Scope

LOS ANGELES – Computing and Software, Inc. has turned out record earnings and revenues for the first half of its current fiscal year. The company made 65 cents per share in the six months ending April 30, 1970, an increase of 36% over the 47 cents per share a year ago.

Net income for the six-month period advanced to $2,986,000 on sales volume of $39,398,000, compared to net income of $2,123,000 on sales of $34,804,000 for this same period a year earlier. All prior year figures are restated to include results of businesses acquired on a pooling-of-interests basis.

Norman E. Friedmann, C&S president and chairman of the board, explained that during the most recent quarter the scope of Computing and Software's business-oriented data processing operations was expanded through acquisition of computing centers in Canada.

"Our computing businesses in Montreal, Ottawa, Quebec City, and Toronto comprise a significant factor of this new market, and signal our initial penetration outside of the U.S.," Friedmann said. "We also strengthened growth prospects for our information processing businesses by adding market-proven proprietary packages in the fields of insurance agency accounting, auto leasing, and data file management."

Computing and Software this past quarter also acquired a firm specializing in account activation for financial institutions. This service involves direct mail processing, including handling of large data bases and utilization of computer letters.

"Within today's economic climate," Friedmann noted, "our record six-month performance is very gratifying, and we expect to report continuing excellent results for the remainder of this year and into 1971."

Computing and Software is active in the management and operation of computing centers and their applications in the field of specialized information exchanges. The firm provides computer related marketing services, processes and markets information derived from proprietary and customer data bases, offers a wide range of financial services, and manufactures components for the peripheral equipment market.

CDC Agrees to Acquire Stock Interest In Elbit Computers Ltd., Israeli Firm

MINNEAPOLIS – Control Data Corp. has revealed that it has entered into an agreement in principle to acquire a controlling stock interest in Elbit Computers, Ltd. of Haifa, Israel. The purchase price was not disclosed.

As part of the transaction, Control Data will purchase the shares of Elbit presently owned by the Israel Government. Under the agreement, Elbit Computers will be jointly owned by Control Data and Elron Electronic Industries, Ltd., also of Haifa.

Elron Electronic Industries is substantially controlled by the Discount Bank Investment Corp. of Tel Aviv and Pec Israel Economic Corp. of New York City.

Elbit Computers was founded jointly by Israel and Elron Electronic Industries in 1967 and is the only commerical enterprise in Israel engaged in the development and manufacture of computers and computer systems.

Elbit produces the Validata Data Entry System, a computer-driven system designed for automatic internal error checking of data entered into computer systems, or for operation as a small terminal to larger computer systems. The Validata system is currently used by all leading commercial banks in Israel.

Defense Systems

The Elbit company is also active in computer-controlled systems and real-time applications of computers, as well as development of defense systems using digital technology.

Control Data said that its worldwide marketing and customer engineering organizations would be utilized for the sale and servicing of computer systems manufactured by Elbit.

CT Plans Second Quarter $2.3 Million Write-Off

DALLAS – The board of directors of Computer Technology, Inc., a facilities management company, has decided to write off $2.3 million of previously deferred subsidiary start-up costs and costs from discontinued facilities. The write-off will go on the books for the second quarter.

A company spokesman said that CT would show a "large loss" for the second quarter, to which the write-off will contribute. In the first quarter, ended March 29, CT reported a loss of $667,000 after a tax-loss carry forward credit of $364,000. Revenues for the period were $9,687,000.

CT President Douglass M. Parnell Jr., also said that the board has approved organizational changes that will result in the merger of three regional subsidiaries into CT. According to Parnell, the subsidiaries will become regional operating divisions of the parent company.

The first quarter figures showed a per share loss of 12 cents, compared to a profit of seven cents per share for the year earlier period.

CT is the center of a legal hassle between G.W. Woerner, former president of the company, and University Computing and LTV-Aerospace, each of which owns 35.5% of CT's outstanding stock.

Woerner contends that when LTV-Aero sold half of its 71% interest in CT to UCC, one condition of the deal was that LTV-Aero cause CT to sign a management contract with UCC at unfavorable terms. He also contends that the deal was unfair to minority stockholders of CT.

Three-Year Contract

The management contract calls for payments of $200,000/mo to UCC and lasts for three years.

NCR Mulls Computer Operations Partner, Has Eyes on Control Data

Special to Computerworld

LONDON – A partner for computer operations is being sought by NCR, according to company sources here. The company reportedly is actively looking at Control Data Corp.

A merger between these two companies, it is said, would create a unified computer company able to call on CDC's expertise in large scientific machines and NCR's knowledge of smaller business-orientated computers to offer a complete across the board industry capability.

Control Data, which has a long history of cooperation with other companies on both sides of the Atlantic, is also believed to have been approached by ICL from the UK.

CDC has previously entered into technological agreements both with ICL over the development of peripherals and with NCR. Under terms of the latter agreement, NCR produced the CDC 160 computer under license as the NCR 305.

To companies such as NCR or ICL a merger with Control Data offers many of the advantages that GE offered to Honeywell – without the disadvantage of parallel systems.

CDC's own long history as an OEM supplier, however, may preclude it from entering into a firm agreement with one company, thus losing much of its own customer base.

Scientific Resources Shows Net Loss of $2 Million

PHILADELPHIA – Scientific Resources Corp. has reported results of operation for the six months ended March 31, 1970. Revenues, excluding those relating to discontinued operations and extraordinary item, were $23,411,818 for the period, compared with $18,219,169 for the same period in 1969.

A loss from continuing operations amounting to $525,221 was experienced for the period compared to income from those operations of $791,683 for the same period in 1969.

The net loss for the period ended March 31, 1970, was $2,044,699, including losses from discontinued operations of $556,418 and an extraordinary loss of $963,060 on disposition of its subsidiary, West Jersey Title & Guaranty Co. Net income for the same period in 1969 was $272,075 which included losses from discontinued operations of $519,608.

After provision for preferred dividends of $735,592 for the six months ended March 31, 1970, and $756,696 for the similar period of the previous year, the net loss per share of common stock was 47 cents and 10 cents respectively.

Per share amounts are based on average common shares outstanding of 5,857,616 during the six months in 1970 and 5,088,424 during the six months in 1969. Results for the six-month period in 1969 have been restated to reflect business operations discontinued subsequent to that date.

Thomas T. Fleming, president of Scientific Resources, stated that results from continuing operations for the six-month period ended 1970 were adversely affected by write-offs and losses approximating $675,000 in the operations of a subsidiary, Digital Resources Corp., which includes the manufacturing operations of Scientific Resources.

Fleming added that it is anticipated that these operations will be profitable during the last six months of the company's fiscal year and that he anticipates substantially improved third and fourth quarters overall.

Delta Data Gets Long-Term Loans

WASHINGTON, D.C. – Delta Data Systems has completed negotiations for $100,000 in long-term financing with Osher Capital Corp., Ft. Washington, Pa., and CMNY Capital Co., New York, N.Y.

A Delta spokesman said that each of the two small business investment corporations have granted five-year, $30,000 loans to Delta. In conjunction with the loans, Delta has granted warrants to Osher and CMNY for the purchase of 26,000 shares of Delta common stock by each.

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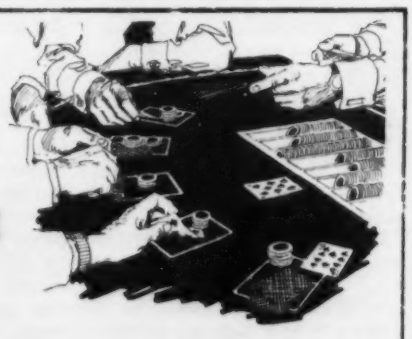

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Earnings Reports

ELECTRONIC MEMORIES & MAGNETICS CORP.
Three Months Ended March 31

	1970	1969
Revenue	$20,506,000	$19,029,000
Earnings	706,000	1,107,000

OPTICAL SCANNING CORP.
Three Months Ended March 31

	1970	e1969
Shr Ernd	a$.02	.....
Revenue	2,258,700	$1,037,000
Tax Cred	b28,000	.....
Earnings	c38,803	d300,000
a 9 Mo Shr	.29	.12
Revenue	7,566,482	6,207,855
bTax Cred	70,000	13,000
cEarnings	230,850	75,893

a-Based on income before tax credits. b-From tax loss carry-forwards. c-Equal to 7 cents a share in the 1970 quarter; 42 cents a share in the 1970 nine months, and 14 cents a share in the 1969 nine months. d-Loss. e-Restated for the nine months, but not the quarter, for the acquisition in April 1970 of Precision Business Forms on a pooling-of-interests basis.

DATA PRODUCTS CORP.
Year Ended March 28

	a1970	f1969
bShr Ernd	$.26	$.34
Revenue	45,262,000	36,397,000
cSpec Cred	173,000	9,674,000
eEarnings	1,815,000	11,736,000

a-Preliminary. b-Based on income before special credit. c-Represents sale of building in 1970 and in 1969 from sale of stock in former subsidiary. e-Equal to 28 cents a share in 1970 and $1.92 a share in 1969. f-Restated to reflect sale of stock in former subsidiary.

CYBERNETICS INTERNATIONAL
Six Months Ended March 31

	1970	a1969
Revenue	$936,735	.....
Loss	1,433,909	.....

a-Due to changes in accounting treatment, meaningful comparative figures are not available.

SANDERS ASSOCIATES
Three Months Ended April 30

	1970	1969
aShr Ernd	$.04	$.22
Revenue	39,813,000	51,861,000
Earnings	190,000	c184,000
a9 Mo Shr	.10	.80
Revenue	124,622,000	136,738,000
Earnings	455,000	d360,000

a-Based on income before adjustments. c-Equal to four cents a share. d-Loss.

PROGRAMMED PROPRIETARY SYS.
Year Ended May 31

	a1970	1969
Shr Ernd	$.35	b$.04
Revenue	2,700,000	387,678
Earnings	525,000	47,947

a-Estimated. b-Reflects 50% of stock dividend in April 1970.

DATA 100 CORP.
Year Ended Dec. 31

	1969	1968
Revenue	$731,018	.....
Loss	919,068	.....

AUTOMATION TECHNOLOGY
Nine Months Ended March 31

	1970	1969
Shr Ernd	$.27	.....
Revenue	6,576,663	$2,451,167
Earnings	620,758	d302,224

d-Loss.

COMPUTER INVESTORS GROUP
Year Ended March 31

	1970	1969
aShr Ernd	$.47	$.30
Revenue	8,418,466	4,734,310
Earnings	907,607	539,261

a-On a fully diluted basis.

MANAGEMENT DATA CORP.
Year Ended Feb. 28

	1970	1969
Shr Ernd	$.80	$.52
Revenue	8,302,685	5,333,710
Earnings	786,518	454,545

Per share earnings on a fully diluted basis would have been 77 cents in 1970 and 49 cents in 1969.

LEASCO DATA PROCESSING
Three Months Ended March 31

	1970	a1969
bShr Ernd	$.51	$.67
cRevenue	132,149,000	114,958,000
Spec Chg	g2,090,000	.....
Earnings	h6,417,000	10,802,000
b6 Mo Shr	1.13	1.50
cRevenue	262,154,000	228,336,000
Spec Chg	g2,090,000	.....
Earnings	h16,545,000	24,225,000

a-Restated by company. b-Based on income before special charge. c-Includes revenues from insurance operations of $102,686,000 in the quarter and $204,114,000 in the six months, compared with $92,229,000 and $185,697,000, respectively, in the like 1969 periods. g-Primarily resulting from the discontinuance of the operations of Nordisk ADB AB, and anticipated loss on investment in 25% owned Dethloff Automatische Geschaftsmaschine GmbH & Co. h-Equal to 39 cents a share in the quarter and $1.01 a share in the six months.

MANAGEMENT DATA CORP.
Year Ended Feb. 28

	$.80	$.52
Shr Ernd		
Revenue	8,302,685	5,333,710
Earnings	786,518	454,545

IMAGE SYSTEMS INC.
Three Months Ended March 29

	1970	1969
Revenue	$1,205,063	$350,077
Loss	889,144	704,338

BANISTER CONTINENTAL CORP.
Year Ended March 31

	1970	1969
Shr Ernd	$.41	$.25
Earnings	1,005,000	459,000

DEARBORN COMPUTER & MARINE
Three Months Ended April 30

	1970	1969
aShr Ernd	$.22	$.77
Revenue	8,449,000	6,260,000
Spec Chg	d3,621,000	.....
Loss	3,278,000	c875,000
a6 Mo Shr	.69	1.49
Revenue	17,019,000	12,202,000
Spec Chg	d3,621,000	.....
Loss	2,551,000	c1,641,000

a-Based on income before special charge and on common and common equivalent shares. c-Income. d-Consists of divesture of pipeline construction in April, 1970; adjustment of carrying values of Indonesian oil interests; closing of Computer Education Division and gain on insurance settlement of offshore drilling rig fire damage claim.

DATAMATION SERVICES, INC.
Three Months Ended March 31

	a1970	a1969
Shr Ernd (Loss)	($.04)	$.05
Revenue	687,485	1,007,413
Earnings (Loss)	(49,872)	51,416

a-On April 21, 1970, the company sold all the capital stock of Computer Systems and Education Corp. and its subsidiaries which had been acquired by the company on March 7, 1969, and for accounting purposes had been treated as a pooling-of-interest in the financial statements for the first quarter of 1969. Since CSEC is no longer a subsidiary of the company, the revenues and expenses have not been consolidated with those of the company for 1969 and 1970, and 1969 figures have been restated accordingly.

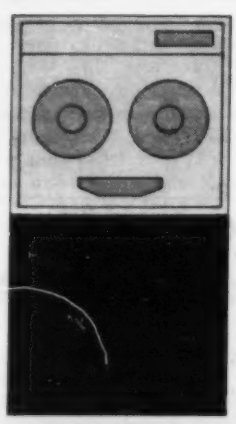
TAB PRODUCTS CO.
Nine Months Ended Feb. 28

	1970	1969
Shr Ernd	$.39	$.37
Revenue	14,470,000	12,684,000
Earnings	327,000	285,000

DATA—DESIGN LABORATORIES
Nine Months Ended March 31

	1970	a1969
Shr Ernd	$.22	$.18
Revenue	5,516,370	3,522,941
Earnings	230,198	186,004

a-1969 excludes sales and earnings for Nasco Engineering, Inc., and Radyne, Inc., for which the prior period comparative figures are not available.



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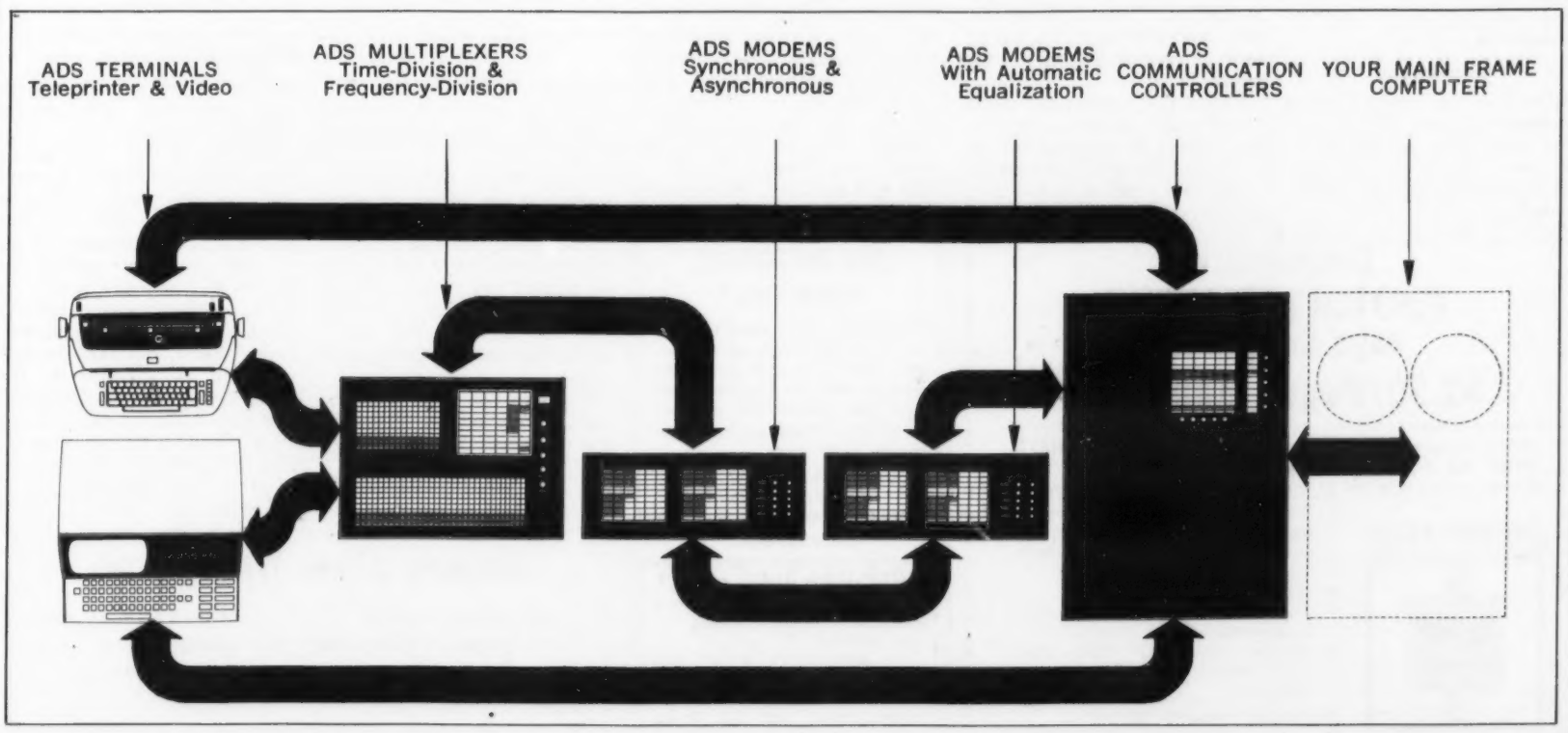

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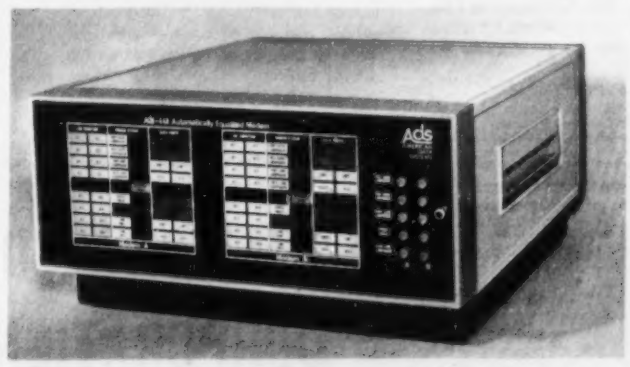

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DATA MODEMS/DATA MULTIPLEXERS/DATA TERMINALS/DATA SYSTEMS

Dicomes on Stocks

Computer Stocks of the Future: Don't Sell Them Short

If one drives into any gas station, he finds a dictum for every President's administration – balanced inflation! Though this may be an honest guarantee so far as tire pressure is concerned, it does not necessarily hold true for national economies and stock markets.

And while one looks for this balanced inflation, the Wall Street analysts give us the old saw, "If the market doesn't go down, it may go up!" "Will the rally last?" Should investors hold some nebulous percentage of their assets in cash for when the market goes down or breaks through new highs? Come now, again; the market is made of firmer stuff!

This rally will last because it is the result of a quiet bottoming of an infirm market that made itself sick with worry and not with figures.

Minirecession

If we have just emerged from a minirecession, let's look at minicomputers. The hottest things on the computer market now, the giants of the industry vie for control.

With Honeywell and GE creating a fortuitous marriage, IBM, Control Data, and Sperry Rand cry havoc within their corps. Who will out? But competition should really be brisk for the next few years. Let us think about this new marketing arena as a good stimulus for speculation in our business again.

Computer stocks for a computer world! IBM seems to be working on its fourth generation within the business. How will the babies do? Time will tell, but still we will buy them and buy more and more whenever the market acts soft!

Continuing with my observations on CW's stock trading summary, I will now finish my rated comments on the software and EDP services group. Always an enigma because of changes in popularity of management and efficiency offered, I am warily making brief comments on this group.

Technically, and because of the recent major slump in the general market, all of the group can be bought for immediate market gains; but, and a major but, perseverance of earnings for the next year can be questionable.

Unlike some of our other rated stocks, the above companies have no basic product mix which we can consider outside of their prime business. Therefore, each one has to be followed closely and rated only on its acceptance within its respective fields.

Again, harsh judgments must prevail and perhaps our message is coming through: because a person is working in a certain field is no reason for investing all his assets in that field!

A new note of interest has come forth which many investors, unhappy because of the great breakdown in prices on some of their favorite computer stocks, have missed.

Even though the market has been most unkind in its treatment of some of our favorities, the mutual funds still like some of our pets. We rate the following computer stocks Buys: (those indicated with an asterisk are among the top 25 favored stocks by the funds) Burroughs*, Control Data, Digital Equipment, General Electric*, Hewlett-Packard, Honeywell, IBM*, National Cash Register, RCA, Sperry Rand, and Xerox*.

When we say fund favorites, this is not in itself an encomium for any one stock. One of the most dynamic funds (Century Shares) in the fifties fizzled in the sixties. Incorporated Investors liked oils too well and died because of it. I am not yet acquainted with a computer fund, but think that it might be well for some of the largest money-managers to really think of one.

Of course, as I say this, and wait for the normal 10-day hiatus between the time of the writing of this column and actual publication, who knows what may happen?

Speaking of 10 days' hiatus June 16 proved another bumper day – up 18 + points. Hang in there and buy the computer stocks we have discussed as buys for the past three weeks. As Barbra Streisand said in "Funny Girl," "Pretty girls (glamor stocks) won't stay in vogue forever!" Again, detached as they are, and as ungeared to the economy, our computer stocks are the staffs of life for the future. Don't sell them short!

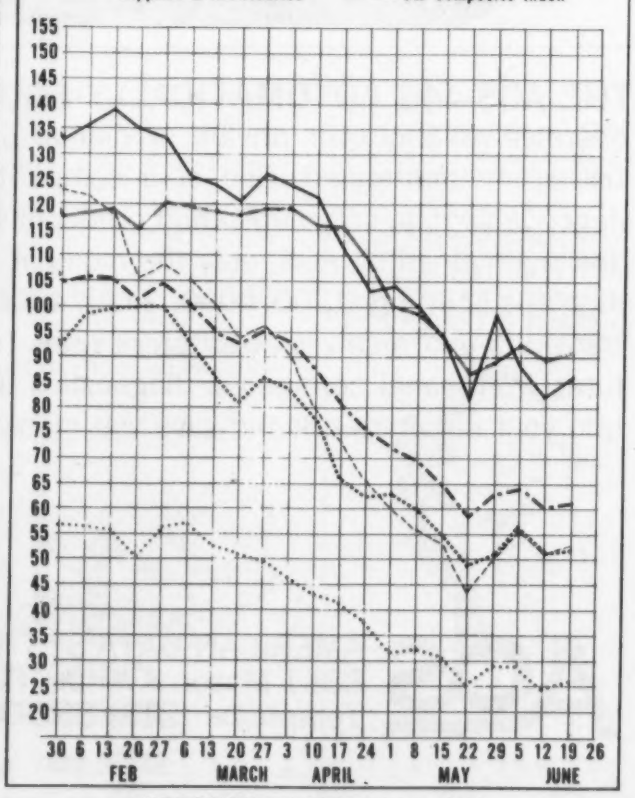
SOFTWARE AND EDP SERVICES

Exchange	Security	Close 6/12/70	Rating
A	Applied Data Res.	5-3/4	Buy
A	Automatic Data Proc.	28-3/4	Hold
A	Computer Appl.	3-1/4	Buy
N	Computer Sciences	11-3/4	Buy
A	Computing & Soft.	23-1/4	Hold
A	Elect. Com. Prog.	6-1/8	Sell/Avoid
A	Itel	9-3/4	Sell/Avoid
A	Management Data	13	Sell/Avoid
N	Planning Research	17-3/8	Hold
N	Scientific Resources	4-5/8	Buy
N	University Comp.	25-5/8	Hold
A	URS Systems	7	Sell/Avoid

N=NYSE
A=ASE

DiComes' Portfolio Evaluation.

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

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Computerworld Stock Trading Summary

NEW YORK AND AMERICAN STOCK EXCHANGE CLOSING PRICES, FRIDAY, JUNE 19; OVER THE COUNTER AND NATIONAL STOCK EXCHANGE, THURSDAY, JUNE 18

SUPPLIES & ACCESSORIES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
N	15- 8	11	ADAMS-MILLIS CORP	+ 1	+ 10.00
O	21- 12	12 1/2	BALTIMORE BUS FORM	+ 1/2	+ 4.17
A	25- 7	8 1/8	BARRY WRIGHT	- 1 3/8	- 14.47
A	35- 17	17 5/8	DATA DOCUMENTS	- 1 1/8	- 6.00
N	19- 12	13 5/8	ENNIS BUS. FORMS	- 1 1/8	- 7.63
O	17- 8	10 1/4	GRAPHIC CONTROLSCORP	+ 1	+ 10.81
N	166- 63	85 1/2	MEMOREX	+ 7 1/2	+ 9.62
N	114- 77	82	3M COMPANY	+ 1 1/2	+ 1.86
O	38- 29	29 3/8	MOORE BUS FORMS	- 1/2	- 1.67
N	43- 21	24 1/8	NASHUA CORP.	- 2 1/8	- 8.10
O	48- 30	32	REYNOLDS & REYNOLD	- 2	- 5.88
O	30- 20	22 3/4	STANDARD REGISTER	+ 1 3/4	+ 8.33
N	39- 24	25 1/4	UARCO	+ 1/2	+ 2.02
A	30- 8	11 5/8	WABASH MAGNETICS	+ 1 1/8	+ 10.71
O	41- 25	31	WALLACE BUS FORMS	+ 1	+ 3.33

COMPUTER SYSTEMS

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
N	172-100	108 1/8	BURROUGHS CORP	+ 6 1/8	+ 6.00
N	37- 14	15	COLLINS RADIO	---	----
N	122- 35	41 1/4	CONTROL DATA CORP	---	----
A	124- 57	72 5/8	DIGITAL EQUIPMENT	+ 3 1/8	+ 4.50
N	11- 4	5 1/8	ELECTRONIC ASSOC.	- 1/8	- 2.38
A	14- 3	4 7/8	ELECTRONIC ENGINEER.	+ 1/8	+ 2.63
N	39- 22	22 3/4	FOXBORO	- 1/2	- 2.15
O	42- 12	15	GENERAL AUTOMATION	- 1/2	- 3.23
N	77- 60	69 3/4	GENERAL ELECTRIC	+ 3 7/8	+ 5.88
N	45- 24	27 1/4	HEWLETT-PACKARD CO	+ 1 3/4	+ 6.86
N	152- 73	78	HONEYWELL INC	- 5/8	- 0.79
N	387-237	270 1/4	IBM	+11 1/4	+ 4.34
N	86- 48	52 5/8	NCR	+ 3 3/8	+ 6.85
N	34- 20	21 1/4	RCA	+ 1/8	+ 0.59
N	33- 16	23 3/4	RAYTHEON CO	+ 3 1/8	+ 15.15
O	8- 2	3 1/2	SCI. CONTROL CORP.	- 3/8	- 9.68
N	40- 24	28	SPERRY RAND	+ 1 5/8	+ 6.16
A	49- 14	17 1/4	SYSTEMS ENG. LABS	---	----
N	29- 12	15	VARIAN ASSOCIATES	+ 1/8	+ 0.84
A	51- 21	26 1/4	WANG LABS.	+ 1	+ 3.96
N	115- 70	80	XEROX CORP	+ 3 3/4	+ 4.92

LEASING COMPANIES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
O	9- 4	5 1/4	BANISTER CONTIN	- 3/8	- 6.67
O	25- 11	11 1/2	BOOTHE COMPUTER	- 1	- 8.00
O	8- 3	4 3/4	BRESNAHAN COMP.	- 1/4	- 5.00
O	8- 2	5 3/4	COMPUTER EXCHANGE	- 1/4	- 4.17
O	18- 4	5 1/4	COMPUTER LEASING	---	----
O	15- 2	---	CYBER-TRONICS	---	----
N	32- 6	12 1/8	DATA PROC. F & G	- 1/2	- 3.96
O	8- 3	3 3/4	DATRONIC RENTAL	- 1/4	- 6.25
A	24- 10	19 3/4	DEARBORN COMPUTER	+ 7 3/8	+ 59.60
O	8- 3	4 1/4	DIEBOLD COMP. LEAS.	---	----
A	10- 3	4 7/8	DPA. INC.	- 1/8	- 2.50
A	22- 7	11 1/2	GRANITE MGT	+ 1/4	+ 2.22
A	44- 5	6 3/4	GREYHOUND COMPUTER	+ 1/8	+ 1.89
N	30- 7	10 5/8	LEASCO DATA PROC.	+ 1/2	+ 4.94
O	5- 2	3	LECTRO COMP LEAS	+ 1/4	+ 9.09
A	19- 3	6 3/8	LEVIN-TOWNSEND CMP	- 1/8	- 1.92
O	3- 1	1 3/4	LMC DATA. INC.	---	----
O	4- 1	2 1/4	MANAGEMENT ASSIST	+ 1/8	+ 5.88
O	8- 3	4 1/2	NCC LEASING	+ 1/8	+ 2.86
O	8- 3	3 1/4	SYSTEM CAPITAL	- 1/4	- 7.14
A	19- 3	13 5/8	U.S. LEASING	+ 1 1/2	+ 12.37

PERIPHERALS & SUBSYSTEMS

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
N	62- 24	26 5/8	ADDRESSOGRAPH-MULT	+ 5/8	+ 2.40
O	15- 2	3 7/8	ALPHANUMERIC	- 1/4	- 6.06
N	48- 13	19	AMPEX CORP	+ 1/2	+ 2.70
A	34- 5	7 7/8	ASTRODATA	+ 7/8	+ 12.50
O	11- 3	6 3/4	BOLT.BERANEK & NEW	---	----
N	14- 6	8 1/4	BUNKER-RAMO	+ 1/4	+ 3.12
A	33- 13	19 1/8	CALCOMP	+ 1 5/8	+ 9.29
O	13- 4	6	COGNITRONICS	---	----
O	12- 5	5 1/8	COLORADO INST.	- 7/8	- 14.58
O	36- 8	12	COMPUTER COMMUN.	+ 1/2	+ 4.35
A	12- 3	5	COMPUTER EQUIPMENT	+ 1/8	+ 2.56
A	28- 13	18 5/8	COMPUTEST	+ 1 1/8	+ 6.43
A	35- 7	9 3/4	DATA PRODUCTS CORP	+ 1/4	+ 2.63
O	23- 6	8	DATA TECHNOLOGY	---	----
O	13- 5	6 1/4	DIGITRONICS	---	----
N	40- 10	15 1/2	ELECTRONIC M & M	+ 1 1/8	+ 7.83
O	8- 3	5	FABRI-TEK	+ 1/8	+ 2.56
O	17- 2	3 1/2	FARRINGTON MFG	- 1/4	- 6.67
O	20- 6	7	INFORMATION DIS	- 1/2	- 6.67
A	67- 17	23	MARSHALL INDUSTRIES	+ 1/2	+ 2.22
A	84- 15	22 3/8	MILGO ELECTRONICS	+ 1 1/4	+ 5.92
N	87- 27	32	MOHAWK DATA SCI.	+ 1 1/2	+ 4.92
O	52- 16	18	OPTICAL SCANNING	- 3 1/2	- 16.28
O	17- 4	5 3/8	PHOTON	---	----
O	4- 1	1 3/4	PHOTO-MAGNETIC SYS.	---	----
A	42- 23	25 3/4	POTTER INSTRUMENT	---	----
O	25- 12	13	PRECISION INST.	- 1 3/4	- 11.86
O	83- 21	28	RECOGNITION EQUIP	- 2 1/2	- 8.20
O	34- 6	7	REDCOR CORP.	- 1 1/4	- 15.15
N	29- 9	10 1/2	SANDERS ASSOCIATES	- 3/8	- 3.45
O	53- 7	11	SCAN DATA	- 2	- 15.38
O	23- 10	13	TALLY CORP.	+ 1/2	+ 4.00
N	25- 11	16	TELEX	+ 1 5/8	+ 11.30
O	50- 8	9	VIATRON	- 1 1/4	- 12.20

SOFTWARE & EDP SERVICES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
O	6- 2	2 1/4	ADVANCED COMP TECH	---	----
A	24- 4	5 1/4	APPLIED DATA RES.	- 1/2	- 8.70
O	18- 4	5 3/4	APPLIED LOGIC	+ 1/4	+ 4.55
O	8- 1	2	ARIES	---	----
A	47- 23	33 1/4	AUTOMATIC DATA PRC	+ 4 1/2	+ 15.65
O	14- 5	7 3/4	AUTO SCIENCES	- 1/2	- 6.06
O	9- 2	3	BRANDON APPL SYS	- 1/4	- 7.69
O	3- 1	1 1/2	COMPUTER AGE INDUS.	- 1/4	- 14.29
A	12- 2	3 5/8	COMPUTER APPL	+ 3/8	+ 11.54
O	14- 3	4 1/2	COMPUTER ENVIRON	- 1/4	- 5.26
NAT	10- 3	4	COMPUTER INDUS.	---	----
O	13- 3	3 1/4	COMPUTER NETWORK	---	----
O	15- 5	7 1/2	COMP. PROPERTY	+ 3/8	+ 5.26
N	34- 7	11 3/4	COMPUTER SCIENCES	+ 1/2	+ 4.44
O	8- 4	4 1/2	COMPUTER USAGE	---	----
A	75- 18	26 1/8	COMPUTING & SOFT	+ 2 7/8	+ 12.37
O	9- 2	3 5/8	COMRESS	+ 1/2	+ 16.00
O	14- 2	3 7/8	COMSHARE	+ 1/8	+ 3.33
O	3- 1	1 3/4	CONSOL. ANAL. CENT.	---	----
O	24- 4	5 1/4	DATA AUTOMATION	---	----
O	28- 9	10	DATA PACKAGING	---	----
O	6- 1	1 7/8	DATAMATION SERVICE	- 1/8	- 6.25
O	9- 5	6 3/4	DATATAB	- 1/4	- 3.57
O	4- 1	2 3/4	DIGITEK	+ 1/4	+ 10.00
O	13- 5	7 1/4	EDP RESOURCES	- 3/4	- 9.38
A	11- 5	7	ELECT COMP PROG	+ 7/8	+ 14.29
O	161- 31	38 1/2	ELECTRONIC DATA SYS.	+ 5 1/2	+ 16.67
O	20- 4	8 1/4	INFORMATICS	- 3/4	- 8.33
A	25- 6	10 3/8	ITEL	+ 5/8	+ 6.41
O	13- 1	---	LEVIN-TOWNSEND SERV.	---	----
A	25- 11	12	MANAGEMENT DATA	- 1	- 7.69
O	8- 3	3 1/8	NAT COMP ANALYSTS	+ 1/8	+ 4.17
O	12- 3	9	NAT.COMP. SERV.	- 1/4	- 2.70
N	54- 13	19 5/8	PLANNING RESEARCH	+ 2 1/4	+ 12.95
O	27- 9	11 1/2	PROGRAMMING METHODS	- 1 1/2	- 11.54
O	5- 2	3	PROGRAMMING & SYS	---	----
O	33- 3	4 3/4	PROGRAMMING SCIENCES	- 3/4	- 13.64
N	22- 3	3 1/2	SCIENTIFIC RESOURCES	- 1 1/8	- 24.32
O	2- 1	1	SOFTWARE SYSTEMS	- 1/8	- 11.11
O	27- 6	8	TBS COMP CENT INC.	---	----
O	4- 2	3 3/8	UNITED DATA CENTER	- 1/8	- 3.57
N	99- 19	26 3/8	UNIVERSITY COMP.	+ 3/4	+ 2.93
A	20- 5	6 7/8	URS SYSTEMS	- 1/8	- 1.79
O	13- 3	3 3/4	U.S. TIME SHARING	+ 1/4	+ 7.14

New Registrations

ISL INC., 495 Java Drive, Sunnyvale, Calif., a company specializing in applying computer and communications technology to the solution of information systems problems involving the collection, processing, evaluation, and dissemination of information, primarily in the reconnaissance and communication fields, filed to register 102,455 shares of common stock. Proceeds, at $12 per share maximum, intended to retire short-term bank indebtedness, for working capital and other corporate purposes. The underwriter is Hambrecht & Quist, 235 Montgomery St., San Francisco, Calif.

COMP-U-CHECK, INC., 19225 West Eight Mile Road, Detroit, a company engaged in providing a computerized check verification service to retail merchants, and engaged in operations in related areas of data processing and retail credit, filed to register 356,602 shares of common stock. Proceeds, at $3 per share maximum, intended to pay certain outstanding loans and other current obligations and certain accounts payable; the balance will be added to the company's working capital and used for general corporate purposes. No underwriter is involved.

BERKELEY COMPUTER CORP., 2398 Fourth St., Berkeley, Calif., a company intending to develop, produce and market remote access computing systems and capability, filed to register 400,000 shares of common stock. Proceeds, at $25 per share maximum, intended to repay short-term debt incurred to finance operations, to produce a second Model 500 computing system, to be used towards production equipment, tools, test equipment, and leasehold improvements, and toward development and production of the Model 1000 computer system; the balance will be added to the company's working capital and used for general corporate purposes. No underwriter is involved.

DATATYPE CORP., 1050 N.W. 163rd Dr. Sunshine State Industrial Park, Miami, Fla., a company proposing to manufacture and market the Dataflow Optical Reading System, filed to register 500,000 shares of common stock. Proceeds, at $8 per share maximum, intended for repaying a bank loan, for repayment of working capital advances currently being made by Runnstrom Industries, Inc., for research and development for the improvement of the company's Dataflow system, for improvement and expansion of the company's present plant facilities and the purchase of equipment and for expansion of its sales organization including opening of six regional offices; the balance will be added to the company's working capital and used for general corporate purposes. The underwriter is S.D. Fuller & Co., Inc., 26 Broadway, New York, N.Y.

UNIVERSAL MEDICAL SERVICES, INC., 781 Third Ave., King of Prussia Industrial Park, King of Prussia, Pa., a company organized for the purpose of providing medical laboratory services and in furnishing a variety of computer services to hospitals, nursing homes and other medical users, filed to register 360,000 shares of Class A common stock and warrants to purchase 180,000 Class A shares, to be offered for public sale in units, each consisting of two shares and one warrant, and at $16 per share unit. Proceeds intended to repay short-term bank loans incurred for working capital purposes, to repay other loans for similar use anticipated to be made prior to the effective date of the prospectus, to make payment of one-year rentals on computer equipment, to pay rentals on laboratory equipment, to develop computer programs and to improve the company's facilities; the balance will be added to the company's working capital and used for general corporate purposes. The underwriter is First Devonshire Corp., 67 Broad St., New York, N.Y.

Acquisitions

Quartet Films, Inc. has been acquired by **Computer Image Corp.** Terms of the acquisition call for the company to acquire all the outstanding shares of Quartet Films' stock in exchange for an undisclosed number of Computer Image shares. Headquartered in Los Angeles, Quartet will operate as a wholly owned subsidiary of Computer Image.

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